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CATALOGUE

A. H. Abbott & Co.

Chicago

No 50 Madison Street

1896

1897

Tel. Main 2429.

CATALOGUE.

A. H. ABBOTT & CO.

Manufacturers and Importers of

Mathematical & Surveying Instruments

.... AND

DRAWING MATERIALS

Of Every Description.



TRADE MARK.

50 MADISON STREET, CHICAGO.

Copyright 1896, by A. H. Abbott & Co.

FOURTH EDITION.

PRICE, 50 CENTS.

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NOTICE.

Many of the numbers in this catalogue have been changed. Customers, in order to avoid mistakes, are therefore requested to mention the edition of the catalogue and catalogue number, and give such other description, referring to size, length, etc., as may be found in the catalogue.

Parties unknown to us will please send with their orders a cash remittance, covering the amount of the order.

The safest methods of sending remittances are by Bank Draft, P. O. Money Order, or by cash sent through the Express companies. Letters containing cash should be registered.

In ordering goods to be sent C. O. D., a remittance of five dollars should be sent with the order. Express charges for collection will be added to the amount of the bill.

Small articles can be sent by mail at one cent per ounce; postage will be added to the price of the goods. Small valuable packages, when ordered to be sent by mail, should be registered.

We insure against loss in the mails at the rate of 5 cts. for any package valued at \$5.00 or less, and 5 cts. additional for any amount over \$5.00 not exceeding \$10.00. This is in addition to the regular postage. Customers wishing their goods insured will please so specify each time. We will not be responsible for loss of goods sent by mail uninsured.

All our goods are **warranted**, and it is our aim to fully satisfy our customers.

All complaints of customers will receive prompt and careful attention.

A. H. ABBOTT & CO.

DRAWING PAPERS.

The Drawing Papers listed in this Catalogue have been carefully selected from the best American and European manufactures, and each one of these papers possesses the exact qualities described for same in this Catalogue.

We beg to call special attention to our well-known trade marks of "GLOBE," "A," "APEX," "NEPTUNE," "COLON," "OLD COLONY," "ESSEX," "APOLLO," "GERMANIC," and "UTILITY" Drawing Papers, as well as Tracing Papers "MARS," "DELOS," "AGIS," "ACHILLES," "PERGAMON," and "ANTIQUE," also our trade marks.

The constantly increasing demand for the above brands of papers is the best proof of their excellent quality, and has added considerably to the high reputation we are enjoying for the goods we are selling.

DRAWING PAPERS.

In Sheets.

No.

1. "Globe" Drawing Paper, slightly grained surface, well adapted for pencil, crayon, color and ink, and very suitable for school use.

Cap,	14x17 inch, per quire.....	\$0 30
Demy,	15x20 " "	45
Medium,	17x22 " "	60
Royal,	19x24 " "	75
Super Royal,	19x27 " "	90
Imperial,	22x30 " "	1 15
Double Elephant,	27x40 " "	2 10

2. "A" Drawing Paper, a good paper for pencil, crayon and school use.

Cap,	14x17 inch, per quire.....	\$0 20
Demy,	15½x19½ " "	25
Medium,	17x22 " "	40
Royal,	19x24 " "	50
Super Royal,	19x27 " "	60
Imperial,	22x30 " "	65
Double Elephant,	27x40 " "	1 25

3. Whatman's Drawing Paper, hot pressed, cold pressed and rough.

Hot pressed has a smooth surface, best adapted for pencil and ink drawings. Cold pressed has a finely grained surface and is used for water color painting and general drawing. Rough has a very coarse surface, suitable for very bold sketching. In ordering state desired surface and size.

Cap,	13x17 in. hot and cold pressed, per quire....	\$0 60
Demy,	15x20 " " " "	90
Medium,	17x22 " " " "	1 30
Royal,	19x24 " " " "	1 65
Super Royal,	19x27 " " " "	2 00
Imperial,	22x30 " " " "	2 85
Atlas,	26x34 " " " "	4 70
Double Elephant,	27x40 " " " "	5 25
Antiquarian,	31x53 " " " per sheet....	1 25
Griffin Antiqu'n,	31x53 " " " "	3 00
Imperial,	22x30 " rough, per quire.....	2 85
Double Elephant,	27x40 " " " "	5 25

4. Whatman's Extra Thick Drawing Paper. Per quire. Per sheet.

Royal,	19x24 in. cold pressed.....	\$3 35	\$0 20
Imperial,	22x30 " hot and cold pressed		
	and rough.....	6 70	35
Double Elephant,	27x40 " cold pressed and rough.....	10 00	60

Our extra thick "Whatman's" Paper, as quoted above, is of the following weights: Royal, 70 lbs. to ream; Imperial, 140 lbs. to ream; Double Elephant, 210 lbs. to ream.

Our new sample book of Drawing Papers, Tracing Cloths, Tracing Papers, etc., will be mailed to any address on receipt of 25 cents.



DRAWING PAPERS.

In Sheets.

No.

- 4A. "Apex" Drawing Paper**, extra fine paper, with "Cold Pressed" surface, suitable for pen, pencil and water color drawing; used as a very good substitute for Whatman's Paper at a lower price.

Royal,	19x24 inch, per quire.....	\$1 25
Super Royal,	20x27 " "	1 75
Double Elephant,	27x40 " "	3 50

- 4B. "Neptune" Drawing Paper**, smooth surface, well adapted for pen and ink work, and very tough. The extremely hard surface and toughness of this paper makes it very suitable for mechanical drawings and map drawings.

Double Elephant,	27x40 inch, per quire.....	\$3 25
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- 5. "Colon" Paper**, cream color. An excellent paper for detail drawings. Very tough, takes water color and ink to perfection.

The cream tint of this paper is agreeable to the eye and permits of frequent handling without soiling.

Royal,	19x24 inch, per quire.....	\$0 90
Imperial,	22x30 " "	1 30
Double Elephant,	26x40 " "	2 10

- 6. Bond Paper**, for tracing, very tough.

	Per 100 sheets.	Per quire.
16x21 inch.....	\$2 50	\$0 75
17x22 "	3 00	90
19x24 "	3 50	1 00
19x30 "	4 25	1 15
22x28 "	5 00	1 40

- 7. Reynolds' English Bristol Board**, white, smooth surface.

	2-ply.	3-ply.	4-ply.	6-ply.
Cap, 12½x15½ inch, per dozen..	\$0 55	\$0 80	\$1 10	....
Demy, 14½x18 " " ..	85	1 25	1 65	....
Medium, 16½x20¾ " " ..	1 15	1 70	2 30	....
Royal, 18 x22½ " " ..	1 40	2 25	2 90	....
Imperial, 21½x28¾ " " ..	3 00	4 50	5 80	\$9 00

Our new sample book of Drawing Papers, Tracing Cloths, Tracing Papers, etc., will be mailed to any address on receipt of 25 cents.

DRAWING PAPERS.

In Sheets.

No.

8. French White Bristol Boards.

			2 Sheets thick. Doz.	3 Sheets thick. Doz.	4 Sheets thick. Doz.	6 Sheets. thick. Doz.
Cap,	12½x16	inch.	\$0 50	\$0 65	\$0 85	....
Demy	16 x20	“	85	1 10	1 45	....
Medium,	17 x21	“	1 10	1 45	1 70	....
Royal,	19 x25	“	1 30	1 70	2 15	....
Super Royal,	21 x27½	“	1 50	2 00	2 75	....
Columbier,	24 x34	“	....	....	5 40	....
Grand Aigle.	28½x42	“	....	....	7 20	\$10 80

9. Patent Office Bristol Board, for Patent Office Drawings.

	Gross.	Dozen.
10x15 inch, 3 ply.....	\$6 00	\$0 60
10x15 " with border, etc., printed.....	8 00	80
15x20 inch.....	12 00	1 20

Our Patent Office Bristol Board is of size and quality required by the rules of the U. S. Patent Office.

Witnesses
By Attorney

10. "Whiteside" Bristol Board, white, smooth surface.

22x28 inch, 4 ply, per dozen.....\$1 80

11. English Parchment.

	14x18 inch.	16x20 inch.	18x24 inch.	24x28 inch.
Per dozen.....	\$5 50	\$7 20	\$9 00	\$13 50
Per sheet.....	50	70	90	1 35

English Parchment is best adapted and generally used for Diplomas, Certificates and Testimonials.

12. Transfer Paper, blue, red, black, and black lead.

11½x18½ inch.....per quire. \$1 50 per sheet, \$0 10

13. Gelatine or Glass Paper.

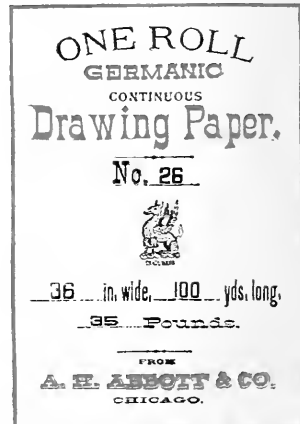
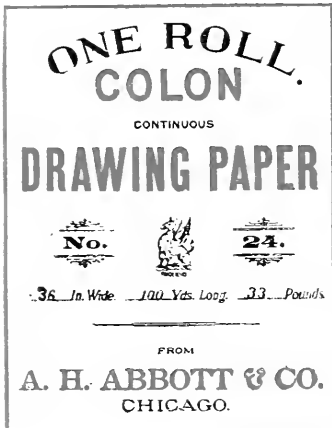
	Thin.	Medium.	Thick.
13x19 inch, per sheet.....	\$0 30	\$0 35	\$0 45

Our new sample book of Drawing Papers, Tracing Cloths, Tracing Papers, etc., will be mailed to any address on receipt of 25 cents.



DRAWING PAPERS.

In Continuous Rolls.



No.

- 20. "Old Colony" Detail Drawing Paper**, smooth surface, 36, 40, 48 and 54 inches wide. In rolls of about 100 lbs. Medium, heavy and extra heavy.

Per lb. \$0 10

Suitable for pattern makers and stone workers.

- 21. "Essex" Detail Drawing Paper**, grained surface, extra quality; will stand erasing well by pencil rubber; 36, 40, 48 and 54 inches wide. In rolls of about 100 lbs. Thin, medium and heavy
- Per lb. \$0 12

	In rolls of 50 yards.	Thin.	Medium.	Heavy
36 inch wide, per roll		\$2 00	\$2 25	\$2 50
40 " " "		2 25	2 50	3 00
48 " " "		2 75	3 00	3 65

- 24. "Colon" Detail Drawing Paper**, cream color, slightly grained surface, medium. 36, 42 and 56 inches wide. In rolls of 30 to 40 lbs.

Per lb. \$0 25

	Per 50 yards.	Per 25 yards.	Per 10 yards.	Per yard.
36 inch wide	\$5 50	\$3 00	\$1 20	\$0 15
42 " "	7 50	4 00	1 55	20
56 " "	8 50	4 50	2 00	25

"Colon" Paper is one of the most desirable papers for sketching and detail drawing. The cream tint of this paper is agreeable to the eye and permits of frequent handling without soiling. "Colon" Paper will take pencil, ink and color to perfection. Will stand erasing and is pliable and tough.

Our new sample book of Drawing Papers, Tracing Cloths, Tracing Papers, etc., will be mailed to any address on receipt of 25 cents.



DRAWING PAPERS.

In Continuous Rolls.

No.

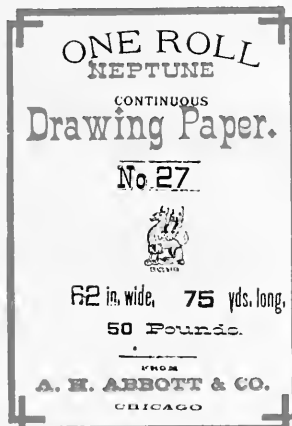
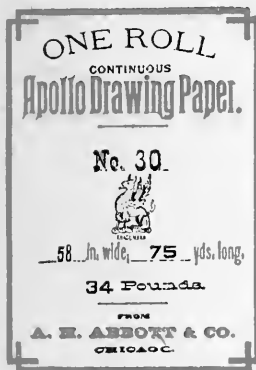
- 26. "Germanic" Drawing Paper**, white, slightly grained surface. Medium. Suitable for drawings in pencil, crayon, pen and ink. 36, 42, 56 and 62 inches wide. In rolls of 30 to 40 lbs.

Per lb. \$0 30

	Per 50 yards.	Per 25 yards.	Per 10 yards.	Per yard.
36 inch wide.....	\$6 00	\$3 60	\$1 60	\$0 20
42 " "	8 40	4 50	2 00	25
56 " "	11 50	6 30	2 85	30
62 " "	12 00	6 60	3 00	35

- 26 "A." White Detail Drawing Paper**, slightly grained. Medium. Well adapted for pencil drawings. 36, 42 and 54 inches wide. In rolls of about 30 lbs.

Per lb. \$0 18



- 27. "Neptune" Drawing Paper**, white, very tough, slightly grained or smooth surface. Medium. In rolls of 30 to 40 lbs. 36 and 42 inches wide.

Per lb. \$0 40

	Per 25 yards.	Per 10 yards.	Per yard.
36 inch wide.....	\$4 75	\$2 00	\$0 25
42 " "	6.00	2 50	30

- 27 A. "Neptune" Drawing Paper**, heavy. In rolls of 30 to 40 lbs. 62 inches wide.

Per lb. \$0 40

	Per 25 yards.	Per 10 yards.	Per yard.
62 inch wide.....	\$10 75	\$4 50	\$0 50

"Neptune" Paper has a very hard surface and is very tough. Best paper for drawings in machine shops, iron works etc. Suitable for all purposes where the drawings have to stand considerable handling. "Neptune" Paper stands erasing to almost any extent.

Our new sample book of Drawing Papers, Tracing Cloths, Tracing Papers, etc., will be mailed to any address on receipt of 25 cents.

DRAWING PAPERS.

In Continuous Rolls.

No.

- 30. "Apollo" Drawing Paper,** smooth back, white, pebbled surface.
Medium thin. 58 inches wide. In rolls of 30 to 40 lbs.

Per lb.	\$0 45		
	Per 25 yards.	Per 10 yards.	Per yard.
58 inch wide.....	\$9 10	\$3 75	\$0 40

"Apollo" Paper is suitable for all kinds of drawing in pencil, ink or color.

- 31. "Apollo" Drawing Paper,** smooth back, white, pebbled surface.
Medium thick, 36, 42 and 58 inches wide. In rolls of 30 to 40 lbs.

Per lb.....	\$0 45		
	Per 25 yards.	Per 10 yards.	Per yard.
36 inch wide.....	\$6 60	\$2 70	\$0 30
42 " "	7 20	3 00	35
58 " "	9 75	4 20	45

- 32. "Apollo" Drawing Paper,** smooth back, white, pebbled surface.
Heavy, 58 inches wide. In rolls of 30 to 40 lbs.

Per lb.....	\$0 45		
	Per 25 yards.	Per 10 yards.	Per yard.
58 inch wide	\$12 60	\$5 40	\$0 65

- 33. "Apollo" Drawing Paper,** smooth back, white, medium smooth surface. Medium. 42 and 58 inches wide. In rolls of 30 to 40 lbs.

Per lb.....	\$0 45		
	Per 25 yards.	Per 10 yards.	Per yard.
42 inch wide.....	\$7 20	\$3 00	\$0 35
58 " "	9 75	4 20	45

- 34. Steinbach Paper.** For solar printing and crayon work. Thin.
53 inches wide.

Per yard.....	\$0 35
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- 35. Steinbach Paper.** Heavy. 53 inches wide.

Per yard.....	\$0 50
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- 36. Grey Eggshell Drawing Paper.**

	Per roll of 10 yards.	Per yard.
62 inches wide.....	\$3 50	\$0 40

- 37. Drawing Parchment,** medium.

38 inches wide, per roll of 20 yards	\$3 50
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- 38. Drawing Parchment,** heavy.

38 inches wide, per roll of 10 yards:.....	\$4 50
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- 39. "Utility" Transparent Sketching Paper.**

36 inches wide, per roll of 50 yards.....	\$2 00
62 " " " " 50 "	3 25

"Utility" Paper is an economical sketching paper; white, very tough and pliable, for tracing, detail drawing, etc. Stands erasing with rubber or knife; takes pencil, ink and water colors perfectly, and is sufficiently transparent to be used for tracing. Its low price makes it a good substitute for the cheaper Manila Detail papers so often used.

MOUNTED DRAWING PAPERS.

In Continuous Rolls of 10 and 20 yards.

No.

- 40. "Germanic,"** white, slightly grained, medium, well adapted for all kinds of work in ink, pencil and color.

	Per 20 yds.	Per 10 yds.	Per yd.
36 inches wide.....	\$10 30	\$5 40	\$0 70
42 " "	13 00	6 75	80
56 " "	17 50	9 00	1 15
62 " "	22 50	11 50	1 40

- 40A. "Colon,"** cream color, medium. An excellent paper for sketching and detail drawings. "Colon" paper stands erasing, takes ink, pencil and color to perfection.

	Per 20 yds.	Per 10 yds.	Per yd.
36 inches wide.....	\$10 30	\$5 40	\$0 70
42 " "	13 00	6 75	80
56 " "	17 50	9 00	1 15

- 41. "Neptune,"** white, very tough, slightly grained or smooth surface, medium.

	Per 20 yds.	Per 10 yds.	Per yd.
36 inches wide.....	\$12 70	\$6 60	\$0 85
42 " "	14 50	7 50	1 00

- 41A. "Neptune,"** heavy.

	Per 20 yds.	Per 10 yds.	Per yd.
62 inches wide.....	\$26 00	\$13 25	\$1 60

- 42. "Apollo,"** white, pebbled surface, suitable for all kinds of fine drawings in pencil, ink or color, medium thick.

	Per 20 yds.	Per 10 yds.	Per yd.
58 inches wide.....	\$21 50	\$11 00	\$1 25

- 43. "Apollo,"** medium.

	Per 20 yds.	Per 10 yds.	Per yd.
36 inches wide.....	\$14 50	\$7 50	\$1 00
42 " "	16 90	8 70	1 10
58 " "	22 30	11 40	1 40

- 44. "Apollo,"** heavy.

	Per 20 yds.	Per 10 yds.	Per yd.
58 inches wide.....	\$25 50	\$13 00	\$1 60

- 45. "Apollo,"** medium, smooth.

	Per 20 yds.	Per 10 yds.	Per yd.
42 inches wide.....	\$16 90	\$8 70	\$1 10
58 " "	22 30	11 40	1 40

- 45A. Paper Cloth,** 38 inches wide, per yard.....\$0 45

Takes pencil, ink and color.

Paper Cloth is made of muslin covered with paper pulp. Can be folded without breaking, and is very desirable for drawings which require much handling.

Our new sample book of Drawing Papers, Tracing Cloths, Tracing Papers, etc., will be mailed to any address on receipt of 25 cents.



MOUNTED DRAWING PAPERS.

In Sheets.

No.

46. Whatman's Drawing Paper, mounted.

Royal,	19x24 inch, per sheet.....	\$0 38
Imperial,	22x30 " "	45
Double Elephant,	27x40 " "	75
Antiquarian	31x53 " "	1 80

46A. Whatman's Drawing Paper, double mounted, paper on both sides of muslin. Especially adapted for atlas work.

Imperial,	22x30 inch, per sheet.....	\$0 80
Double Elephant,	27x40, " "	1 25

47. "Apollo" Drawing Paper, mounted.

18x24 inch, per sheet.....	\$0 30
22x30 " "	40
27x40 " "	70
31x53 " "	1 50

47A. "Apollo" Drawing Paper, double mounted, paper on both sides of muslin. Especially adapted for atlas work.

22x30 inch, per sheet.....	\$0 70
27x40 " "	1 10

Our mounted Apollo Papers, in sheets, are made of Apollo Paper No. 31. medium thickness.

Mounted papers in sheets are furnished with muslin, standing over from 1 to 1½ inch all around the edges of sheets.

Large pieces of mounted paper, for State, County and City maps, etc., made to order.

WATER COLOR BOARD.

47B. Water Color Board, in sheets, 1⁄8 inch thick.

26x38 inch, per sheet.....	\$0 50
30x40 " "	55
The same, 1⁄8 inch thick, 38x52 inch, per sheet.....	1 75

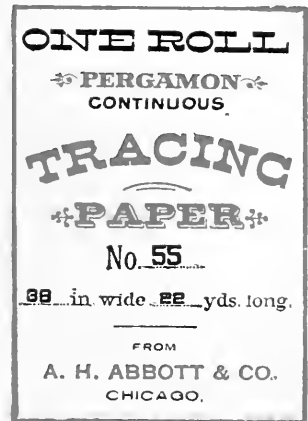
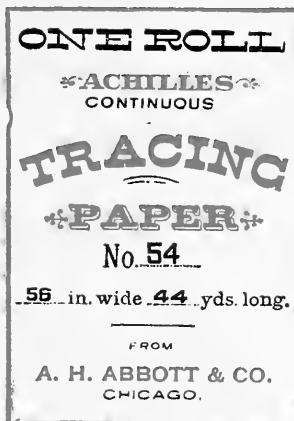
These boards are covered on both sides: either surface may be used. Surfaces are usually white on one side and cream or gray colored on the other.

These Water Color Boards are suitable for perspective drawings in water colors, drawings of elevations of buildings, and all kinds of drawings made for competition.

Our new sample book of Drawing Papers, Tracing Cloths, Tracing Papers, etc., will be mailed to any address on receipt of 25 cents.

No.	In Sheets.		
48.	French Vegetable , very transparent and tough.		
	Cap,	13x17 inch, per quire.....	\$0 95
	Royal,	19x25 " "	2 00
	Imperial,	22x28 " "	2 50
48A.	"Mars," thin, white.		
		20x30 inch, per quire.....	\$1 00
		30x40 " "	2 00

In Rolls.



- | | | |
|-------------|---|----------------|
| 51. | “Delos” Tracing Paper , thin, transparent and tough.
In rolls of 20 yards, 43 inches wide, per roll..... | \$1 50 |
| 52. | “Agis” Tracing Paper , medium, transparent and tough. Will stand considerable handling.
In rolls of 20 yards, 43 inches wide, per roll..... | \$2 00 |
| 54. | “Achilles” Tracing Paper , thin, for transferring, glazed or dull surface.
In rolls of 44 yards, 57 inches wide, per roll.....
“ “ 22 “ 57 “ “ “ | \$4 00
2 00 |
| 55. | “Pergamon” Tracing Paper , medium, very tough and transparent.
In rolls of 22 yards, 39 inches wide, per roll..... | \$3 25 |
| 55A. | “Pergamon” Tracing Paper , heavy, very tough and transparent.
In rolls of 22 yards, 39 inches wide, per roll..... | \$3 75 |
| 56. | “Antique” Tracing Paper , thin, yellow.
In rolls of 100 yards, 40 inches wide, per roll.....
“ “ 100 “ 48 “ “ “ | \$2 00
2 50 |

Our new sample book of Drawing Papers, Tracing Cloths, Tracing Papers, etc., will be mailed to any address on receipt of 25 cents.



TRACING OR VELLUM CLOTHS.

One side glazed, the other dull, and both sides glazed.

57. Excelsior Tracing Cloth.

In rolls of 24 yards, 30 inches wide, per roll.....	\$ 8 20
" " 24 " 36 " " "	9 00
" " 24 " 42 " " "	11 60

Excelsior Tracing Cloth is the most transparent cloth, and therefore very suitable for tracing drawings of faint lines, also especially adapted for tracings to be copied by blue or black process.

59. Imperial Tracing Cloth, white.

In original rolls of 24 yards, 30 inches wide, per roll.....	\$ 6 90
" " " 24 " 36 " " "	7 60
" " " 24 " 42 " " "	10 50
" " " 24 " 54 " " "	15 00
In rolls of 10 yards, 30 inches wide, per roll.....	3 50
" " 10 " 36 " " "	4 00
" " 10 " 42 " " "	5 00
" " 10 " 54 " " "	7 50

60. Reliance Tracing Cloth, white, heavy.

In original rolls of 24 yards, 30 inches wide, per roll.....	\$ 6 00
" " " 24 " 36 " " "	6 80
" " " 24 " 42 " " "	9 50
In rolls of 10 yards, 30 inches wide, per roll.....	3 00
" " 10 " 36 " " "	3 50
" " 10 " 42 " " "	4 50

POWDER FOR TRACING CLOTH.

65. Powder for Tracing Cloth.

In tin boxes, per box.....	\$0 15
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The glazed surface of the cloth makes it often difficult to apply ink. After rubbing the glazed side of the cloth with this powder, carefully using a chamois, and then entirely removing the powder again, the surface of the cloth will easily take ink.

Our new sample book of Drawing Papers, Tracing Cloths, Tracing Papers, etc., will be mailed to any address on receipt of 25 cents.



DIRECTIONS

For Copying Tracings by the Blue Process.

This Blue Process, now extensively used in the Drawing Rooms of our most prominent Railroads, in Engineers' and Architects' Offices, saves not only much labor and expense, but a great deal of weariness to the junior draftsmen, to whose lot it usually falls to make copies or tracings of drawings. The manipulations required are of the simplest possible kind, and are entirely within the skill and comprehension of any office-boy who can be trusted to copy a letter in an ordinary press. These particulars are as follows:

1. Provide a Copying-frame of proper size, with Glass and Cushion.
2. Lay the frame on the glass side, remove the back and cushion and place the tracings on the glass, face downward.
3. Place on the tracing the prepared paper, the prepared side next to the tracing, and be sure to have tracing and prepared paper perfectly smooth, to insure *perfect contact* of tracing and prepared paper, as otherwise the lines of copy will appear indistinct or not at all.
4. Place the cushion on the paper, again taking care to have it perfectly smooth, and close the back of frame.
5. Reverse the frame and expose the whole to a clear sunlight, by pushing it out on a shelf from an ordinary window, or in any other convenient way, for six or ten minutes. If clear daylight only can be had, the exposure must be continued for thirty or forty-five minutes, and under a cloudy sky, sixty to ninety minutes may be needed.

6. Remove the prepared paper and drench it freely for ten minutes or longer in clear water, and hang it by one edge to dry.

The paper should be stored in a dry place, and be entirely shielded from daylight before being used and while putting it into the frame.

The paper is of a full yellow or bronze color. After the exposure to the light the surface becomes a darker bronze or yellowish gray, and the lines of the tracing appear still darker on the surface. Upon washing the paper, the characteristic blue tints appear with the lines of the tracing in vivid contrast.

Such copies can be taken only from tracings made on tracing-paper or cloth. *A very deep black India Ink* should be used, as the distinctness of the copies depends thereon.

If a copying frame is not obtainable, the cushion (or smoothly-folded blanket) can be placed on a board, and on this successively the prepared paper, tracing and plate-glass.

Copies Made to Order from Tracings.

We are prepared to make copies from tracings sent us, by the "Blue" and "Black" Process (black lines on white background).

Copies made to order by the Murillo Process, from drawings on any kind of drawing paper.

Customers wishing to have copies made in *various colors*, by our "Murillo" Process, will have to use our "Murillo Inks" for their original drawings.

Copies are made at short notice, and at reasonable prices.

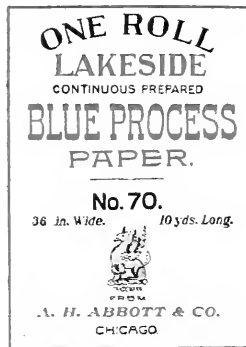


“LAKESIDE” PREPARED BLUE PROCESS PAPERS.

In Continuous Rolls.

Our paper is made of the very best material and prepared according to a special and improved recipe, and will produce the most distinct white lines on a fine blue background. The paper is of even texture and very tough, so as not to tear when, after exposure, the copy is being washed. Our paper is free from streaks and always freshly prepared.

We also prepare a *quick printing* Blue Process Paper, requiring an exposure of from one to one and one-half minute in sunlight, and from one to five minutes only, in cloudy weather. We furnish this paper at the same price as our regular Lakeside Blue Process Paper. Customers desiring the quick-printing paper will please so specify when ordering.



No.

70. “Lakeside,” smooth finish, very fine quality, medium thickness.

	30 inch.	36 inch.	42 in. wide.
Per roll of 10 yards.....	\$0 87	\$1 00	\$1 15
“ “ 50 “	4 10	4 70	5 25

71. The same, thick.

Per roll of 10 yards.....	1 00	1 15	1 30
“ “ 50 “	4 75	5 50	6 25

71B. The same, extra thin (for mailing purposes).

Per roll of 10 yards.....	84	96	1 08
“ “ 50 “	3 60	4 20	4 80

“LAKESIDE” UNPREPARED BLUE PROCESS PAPERS.

In Rolls of 50 yards.

72. “Lakeside,” satin finish, very fine quality, medium.

	27 inch.	30 inch.	36 inch.	42 inch.	54 in. wide.
Per roll	\$3 00	\$3 25	\$3 90	\$4 40	\$5 40

73. The same, thick.

Per roll.....	3 60	4 00	4 70	5 40	6 60
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76. The same, glazed, tough and thin, very suitable for copies to be mailed.

	30 inch.	36 inch.	42 in. wide.
Per roll.....	\$2 75	\$3 40	\$3 75

Our new sample book of Drawing Papers, Tracing Cloths, Tracing Papers, etc., will be mailed to any address on receipt of 25 cents.



“LAKESIDE” BLUE PROCESS CLOTH.

No.			
76A.	Prepared.	36 inch.	42 in. wide.
	Per roll of 10 yards.....	\$3 50	\$4 50
76B.	Unprepared.		
	Per roll of 10 yards.....	2 70	3 60

PREPARED BLACK PRINT PAPER.

76C.	Black Print Paper.	30 inch.	36 inch.	42 in. wide.
	In rolls of 10 yards.....	\$2 50	\$3 00	\$3 50

Black Print Paper No. 76C, for copying tracings, will produce dark lines on a white background. This Black Print Paper is to be treated like the ordinary blue print paper, requiring a **water-bath only**. In washing copies, care must be taken that the water-bath is kept perfectly clean. Paper requires about ten minutes of exposure in sun light, when the paper will turn to a cream white under the tracing.

MURILLO PROCESS MATERIAL.

This process is now being used to a considerable extent for the copying of drawings in different colors. Drawings made on any kind of drawing paper and made in our “Murillo” Transfer Inks, may be copied by the Murillo Process, the copies showing the various colors of the original.

Murillo Pads, for copying drawings or type-written matter.

7x11	10x13	13x17	18x24 inches.
\$2 00	\$3 50	\$6 50	\$12 00 each.

Larger sizes made to order.

Rope Detail Paper, for copying.

	36 inch.	42 inch.	48 in. wide.
Per roll of 50 yards.....	\$2 50	\$3 00	\$3 50

White Copying Paper.

	30 inch.	36 inch.	42 in. wide.
Per roll of 50 yards.....	3 00	3 75	4 25

Murillo Copying Cloth, white.

	36 inch.	42 in. wide.
Per roll of 10 yards.....	2 50	3 00

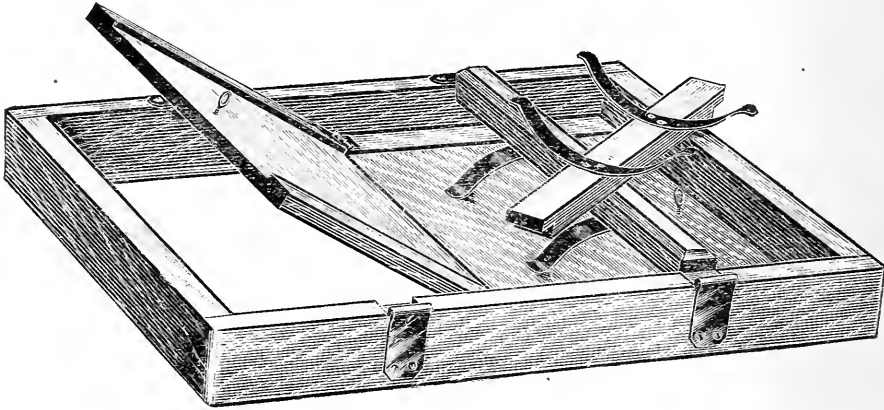
For prices of our “**Murillo**” **Inks**, see under “Inks.”

Our new sample book of Drawing Papers, Tracing Cloths, Tracing Papers, etc., will be mailed to any address on receipt of 25 cents.



COPYING FRAMES AND ZINC BATH TRAYS

For the Blue and Black Process.



No.

77. Blue Print Frames, made of hard wood, with brass springs, carpet cushion.

	Polished Plate Glass.	Double Thick Glass.	Frame only.
20x24 inches, each.....	\$10 25	\$ 7 50	\$ 6 25
24x30 " "	12 50	9 50	8 00
30x42 " "	22 50	16 00	12 50
36x60 " "	43 00	27 50	20 00

Large Print Frames, for exposure outside of window, rolling on iron carriage, etc., furnished to order.

77A. Bath Trays, made of zinc, with drain pipe and wooden braces.

20x24 inches, each..	\$3 75
24x30 " "	4 50
30x42 " "	6 00
36x60 " "	8 00

77B. Blue Print Ink, for drawing or writing on Blue Process Paper and Cloth, and for altering copies made on Blue Process Paper and Cloth. Per bottle.....\$0 20

JAPANNED AIR TIGHT TIN TUBES

For Blue Print Paper.

77C. Tubes.

For rolls of 10 yards, 32 inches long.....	\$1 25
" " 10 " 38 " "	1 50
" " 10 " 44 " "	2 00
" " 50 " 32 " "	1 50
" " 50 " 38 " "	1 80
" " 50 " 44 " "	2 25

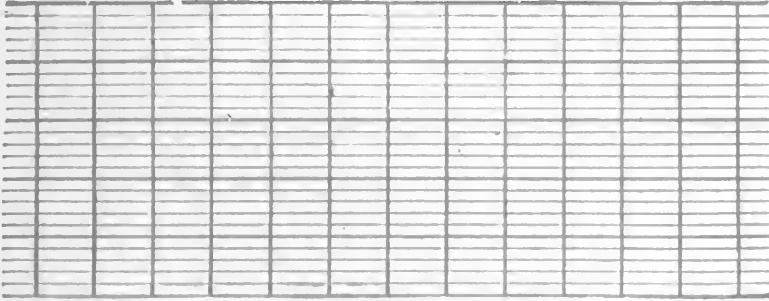
These tubes are intended for the keeping of cut rolls of prepared Blue Print Paper, and are also suitable for the storing of valuable tracings and maps.

77D. Felt, for Blue Print Frames.

72 inches wide, per yard.....	\$3 25
-------------------------------	--------



PROFILE PAPERS.



No. 79.

Printed in Orange or Green.

No.

78.	Plate A,	15 x 42 inch, horizontal ruling 4, vertical ruling 20 to 1 inch.	Per quire.... \$8 50	Per sheet.....	\$0 40
					Per yard.
79.	"	" Continuous, 20 in. wide.	Per roll of 50 yds., \$12 00...		\$0 30
80.	"	" " 10 inches wide.....			20
81.	"	" " 20 inches wide, mounted on muslin....			75
82.	"	" " 10 inches wide, mounted on muslin....			50
82A.	"	" " 20 inches wide, orange only. Printed on tracing paper.	Per roll of 50 yards, \$12 00....		30



No. 84.

Printed in Orange or Green.

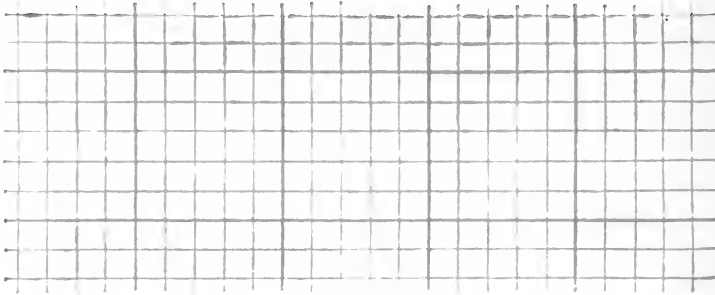
83.	Plate B.	13½ x 42 inches, horizontal ruling 4, vertical ruling 30 to 1 inch.	Per quire.... \$8 50.	Per sheet.....	\$0 40
					Per yard
84.	"	" Continuous, 20 in. wide, per roll of 50 yds, \$12 00...			\$0 30
85.	"	" " 9 inches wide			20
86.	"	" " 20 inches wide, mounted on muslin....			75
87.	"	" " 9 inches wide, mounted on muslin....			50
88.	"	" " 20 inches wide, orange only. Printed on tracing paper, per roll of 50 yards, \$12 00.....			30

Our new sample book of Drawing Papers, Tracing Cloths, Tracing Papers, etc., will be mailed to any address on receipt of 25 cents.



PRINTED "STERLING" CROSS SECTION PAPERS.

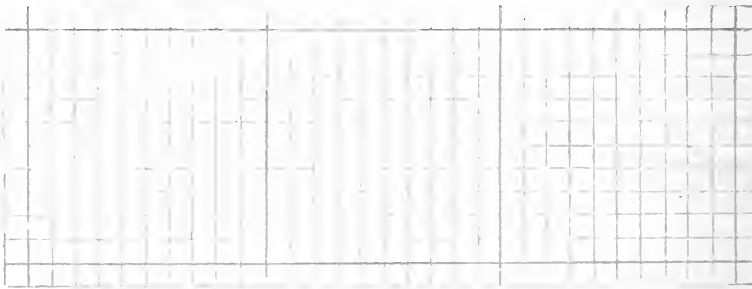
No. 100, 101 and 102 printed in Orange, Blue or Green.



No.

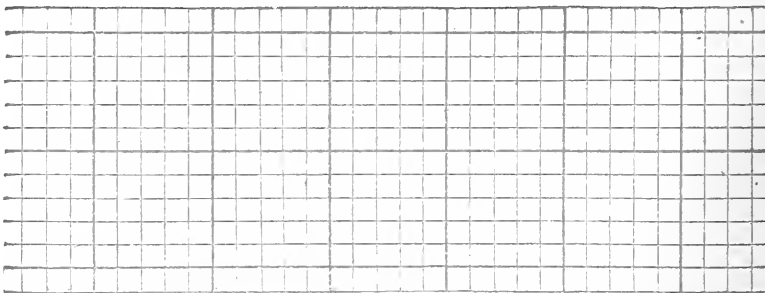
No. 100.

- 100. Cross Section**, 8 feet to 1 inch, dimensions of engraving
 $16\frac{1}{4} \times 22$ inches. Per quire\$4 25 Per sheet ... \$0 25



No. 101.

- 101. Cross Section**, 10 x 10 to 1 inch, dimensions of engraving
 16 x 20 inch. Per quire.....\$4 25 Per sheet..... \$0 25
- 101A. Cross Section**, 10 x 10 to 1 inch, dimensions of engraving
 16 x 20 inch, printed on tracing paper. Per quire, \$4 25.
 Per sheet..... 25



No. 102.

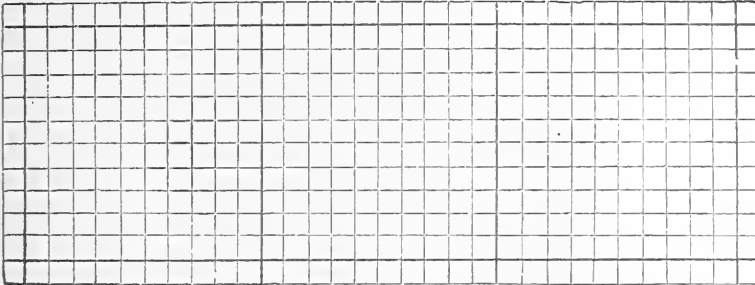
- 102. Cross Section**, 5 x 5 to $\frac{1}{2}$ in., dimensions of engraving 16x20
 inch. Per quire.....\$4 25 Per sheet..... \$0 25
- 103. Cross Section Paper**, 16 x 16 to 1 inch, dimensions of en-
 graving 16 x 20. Per quire.....\$4 25 Per sheet.... 25
- 104. Metric Cross Section**, millimeter, 40 x 50 cm.
 Per quire.....\$4 25 Per sheet..... 25

Our new sample book of Drawing Papers, Tracing Cloths, Tracing Papers, etc., will be mailed to any address on receipt of 25 cents.



RULED CROSS SECTION PAPERS.

- No.
- 105. Cross Section Paper**, 16 x 21 inch, 5 x 5 to 1 inch, lines ruled in blue, per quire \$1 00
- 106. Cross Section**, 16 x 21 inch, 8 x 8 to 1 inch, lines ruled in blue, per quire..... 1 00



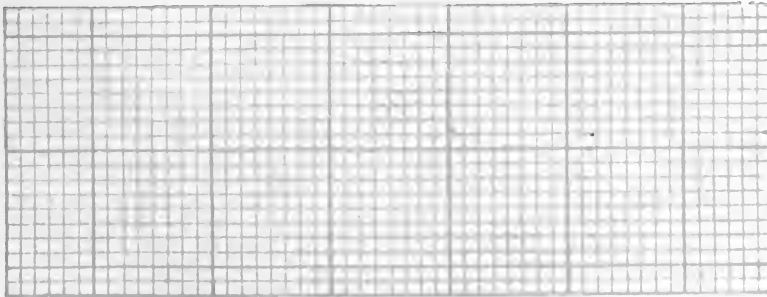
No. 107.

- 107. Cross Section**, 16 x 21 inch, 10 x 10 to 1 inch, lines ruled in blue, per quire \$1 00
- 108. Topographical Paper**, 16 x 21, ruled in red and blue, 400 feet to the inch, per quire..... 1 00

CONTINUOUS CROSS SECTION PAPERS.

Printed in Orange or Green.

- 109. Cross Section**, 10 x 10 to 1 inch, 20 inch wide, per roll of 50 yards.....\$12 00 Per yard..... \$0 30



No. 110.

- 110. Cross Section**, 16 x 16 to 1 inch, 20 inch wide, per roll of 50 yards.....\$12 00 Per yard..... \$0 30
- 111. Cross Section**, millimeter, 50 cm. wide, per roll of 50 yards\$12 00 Per yard 30

Our new sample book of Drawing Papers. Tracing Cloths, Tracing Papers, etc., will be mailed to any address on receipt of 25 cents.



FIELD BOOKS FOR

No.
115.

Construction Field Book, $4\frac{1}{2} \times 7\frac{1}{2}$ inch, 60 leaves..... Each. Per doz.
\$0 50 \$4 50

No.
117.

Transit Book, $4\frac{1}{4} \times 7\frac{1}{2}$, 60 leaves..... Each. Per doz.
\$0 50 \$4 50

No.
119.

Level Book, $4 \times 6\frac{1}{2}$ inch, 60 leaves..... Each. Per doz.
\$0 50 \$4 00

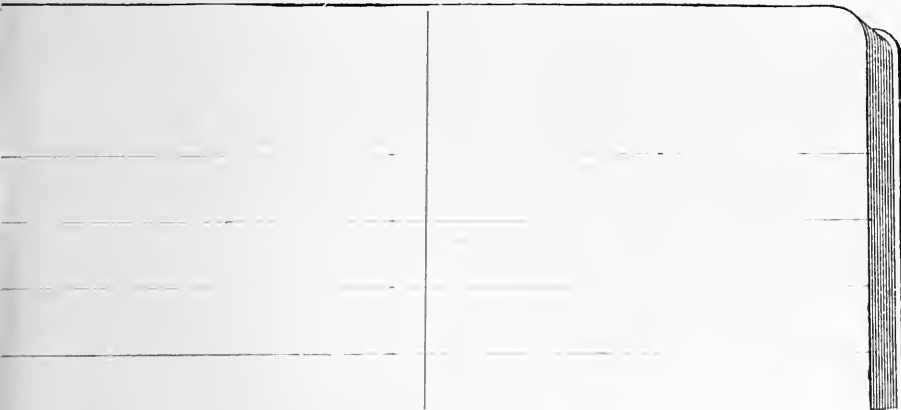
All our Field, Transit and Level Books are bound in leather, and have round corners.
Field, Level and Transit Books, with rulings different from those illustrated as above, made to order.



RAILROAD ENGINEERS.



No.	Each.	Per doz.
116. The same, 80 leaves.....	\$0 60	\$5 50



No.	Each.	Per doz.
118. The same, 80 leaves.....	\$0 60	\$5 50



No.	Each.	Per doz.
120. The same, 80 leaves.....	\$0 60	\$5 50

order in lots of not less than three dozen of a kind.



CROSS SECTION AND

No.
123.

[illegible]

	Each.	Per doz.
Cross Section Book, 6½x8½ inch, ruling 10 parts to 1 inch, on both sides, 80 leaves.....	\$1 00	\$9 50

No.
125.

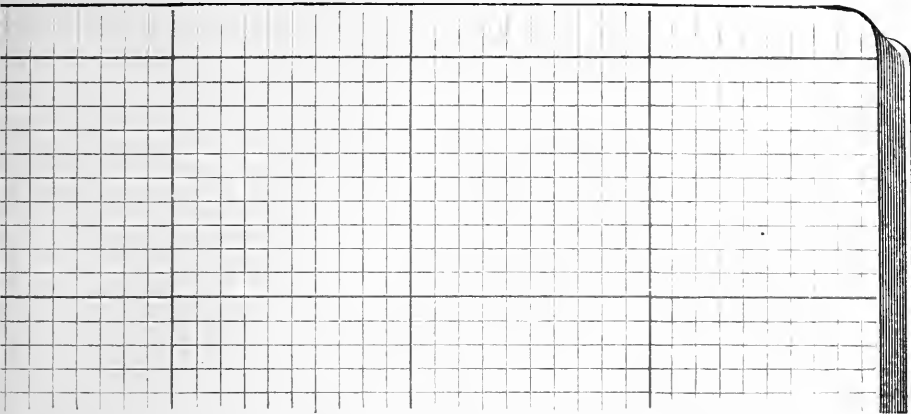
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Record Book, 5x7½ inch, 80 leaves.....

Our Field, Cross Section and Record Books have spring backs, so as to open flat.



RECORD BOOKS.



No.		Each.	Per doz.
124.	Cross Section Book, $5\frac{1}{2} \times 7\frac{1}{2}$ inch, ruling same as		
	No. 123, 80 leaves.....	\$0 60	\$6 00



	Each.	Per doz.
.....	\$0 90	\$9 00

her patterns and styles of Field, Cross Section, and Record Books, etc., made to order.

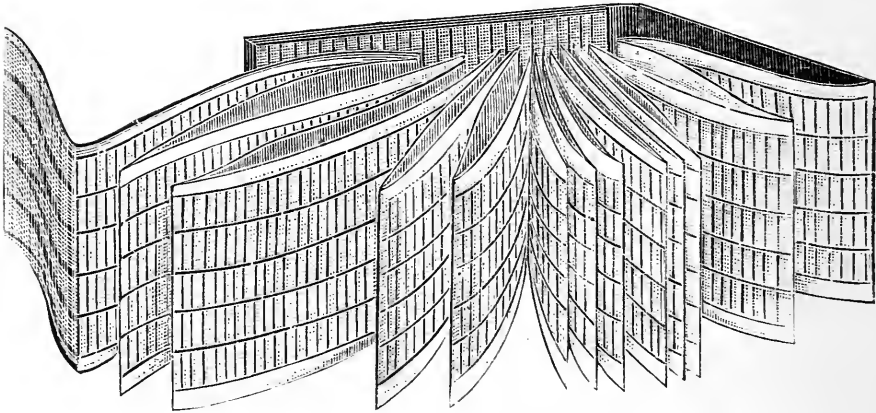
PROFILE BOOKS.

No.

- 126. Pocket Profile Books**, each leaf, or two pages, representing 6,000 feet, or a sufficient length to contain an average section. Size of book, $5\frac{3}{4} \times 8\frac{1}{2}$ inch.

	Each.
Plate A, or B, 25 leaves, bound in morocco.....	\$1 75
“ “ 50 “ “ “	2 25
“ “ 100 “ “ “	3 00

Pages of Plate A are $5\frac{1}{2} \times 8$ inch, and of Plate B $4\frac{3}{4} \times 8$ inch.



No. 127.

- 127. Continuous Profile Books**, mounted upon a continuous piece of muslin, and bound in book form. Books of Plate A show a profile of 100 feet in width, on a horizontal scale of 4, and vertical of 20 to an inch; size of book, $5\frac{1}{2} \times 8$ inch. The books of plate B show a profile of 125 feet in width, on a horizontal scale of 4, a vertical of 30 to an inch; size of book, $4\frac{3}{4} \times 8$ inches. Plate A or B, bound in morocco, with elastic bands.

	Each.
12 miles.....	\$2 00
25 “	3 25
50 “	5 40
100 “	9 50

The above, bound in sealskin, turned edges, \$1 50 each additional. Special lengths made to order.



MATHEMATICAL INSTRUMENTS.

We beg to call special attention of Architects, Engineers and Draftsmen generally to our *Genuine Swiss Instruments*. There being so many spurious goods in this line offered in the present market, sold as "Genuine Swiss" make, or "as good as Swiss," we deem it our duty to mention the fact that our finest Swiss instruments are made by the world renowned firm of Kern & Co., Switzerland.

The excellent workmanship, finish and, in fact, general superiority of instruments made by the above firm, are too well known to the profession to make necessary any further praise or recommendation.

We are carrying Dividers and Compasses of our Swiss instruments tongue jointed as well as in the now so much preferred pivot joint style, as shown by illustration below.



Cross
Section of
Pivot Joint
Dividers.



DIVIDERS WITH TONGUE JOINT.



DIVIDERS WITH PIVOT JOINT.

Our "Finest German" instruments are of the best manufacture, and excel in finish, workmanship and durability.

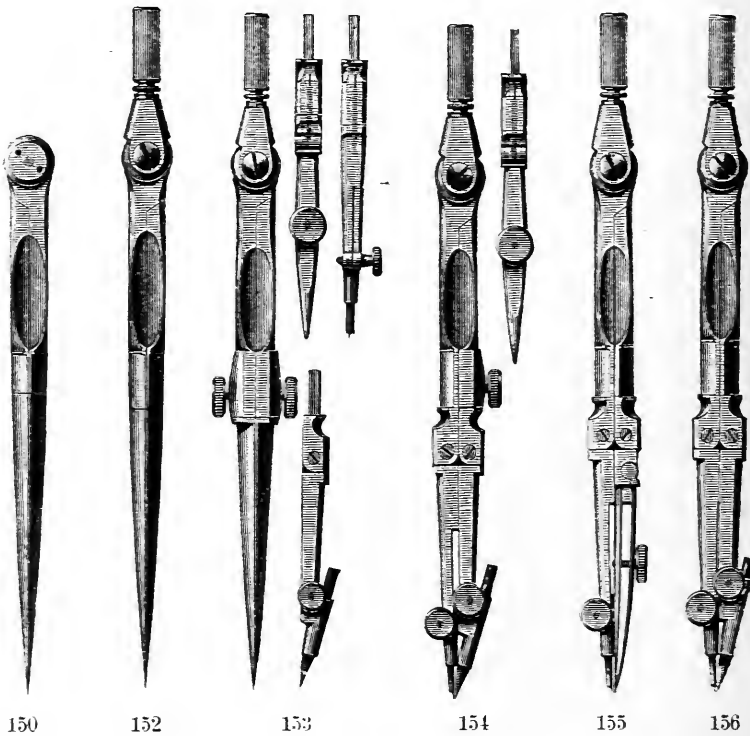
Sets Nos. 425 to 428 of German instruments we beg to recommend for school use.

A cheaper grade of instruments, for the same purpose, we furnish in our sets Nos. 430 to 434, and in the "French" instruments.



FINEST SWISS INSTRUMENTS.

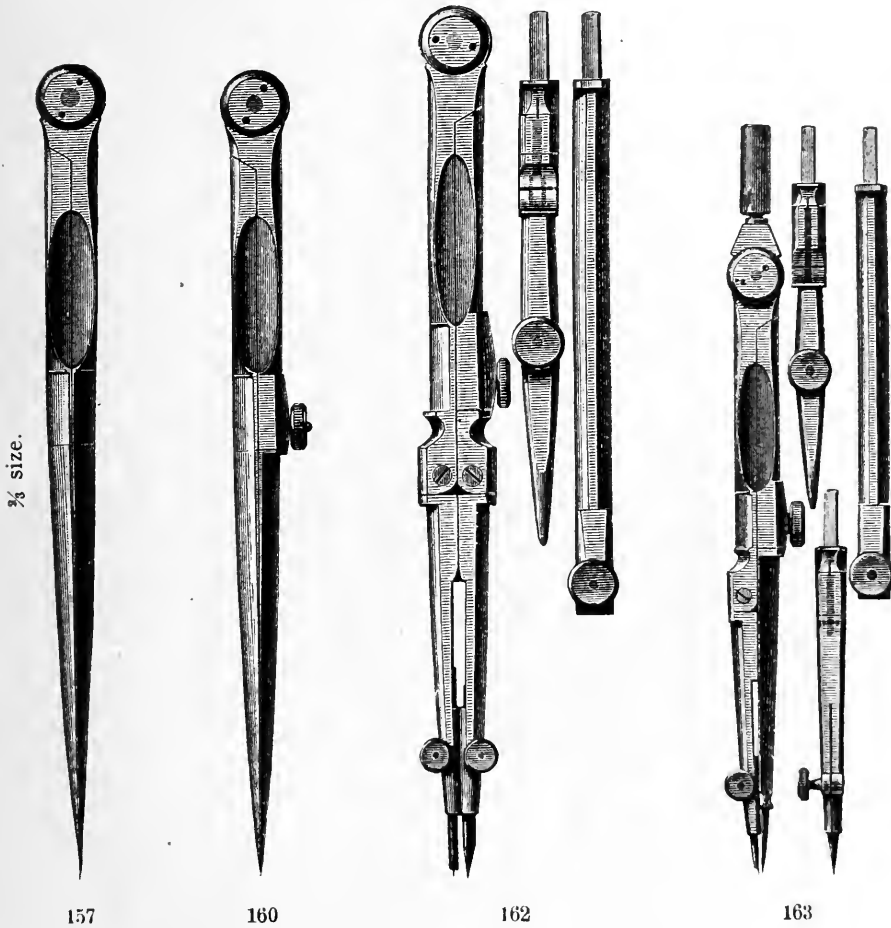
These instruments are made of best German silver and steel. They are of light weight and of a symmetrical form, provided with the latest and best improvements. The *pencil points* are made for A. W. Faber's and for Hardtmuth's Kohinoor leads. The *needle points* have a shouldered needle instead of the common needle.



No.		Each.
150.	Plain Dividers, $3\frac{1}{2}$ inch.....	\$1 75
152.	" " with handle, $3\frac{1}{2}$ inch.....	2 00
153.	Compass, $3\frac{1}{2}$ inch, with pen, pencil and needle points.....	6 00
154.	" $3\frac{1}{2}$ inch, fixed needle point, pen and pencil points..	5 25
155.	" $3\frac{1}{2}$ inch, with fixed needle and pen points (bow pen)	3 50
156.	" $3\frac{1}{2}$ inch, with fixed needle and pencil points (bow pencil).....	3 50

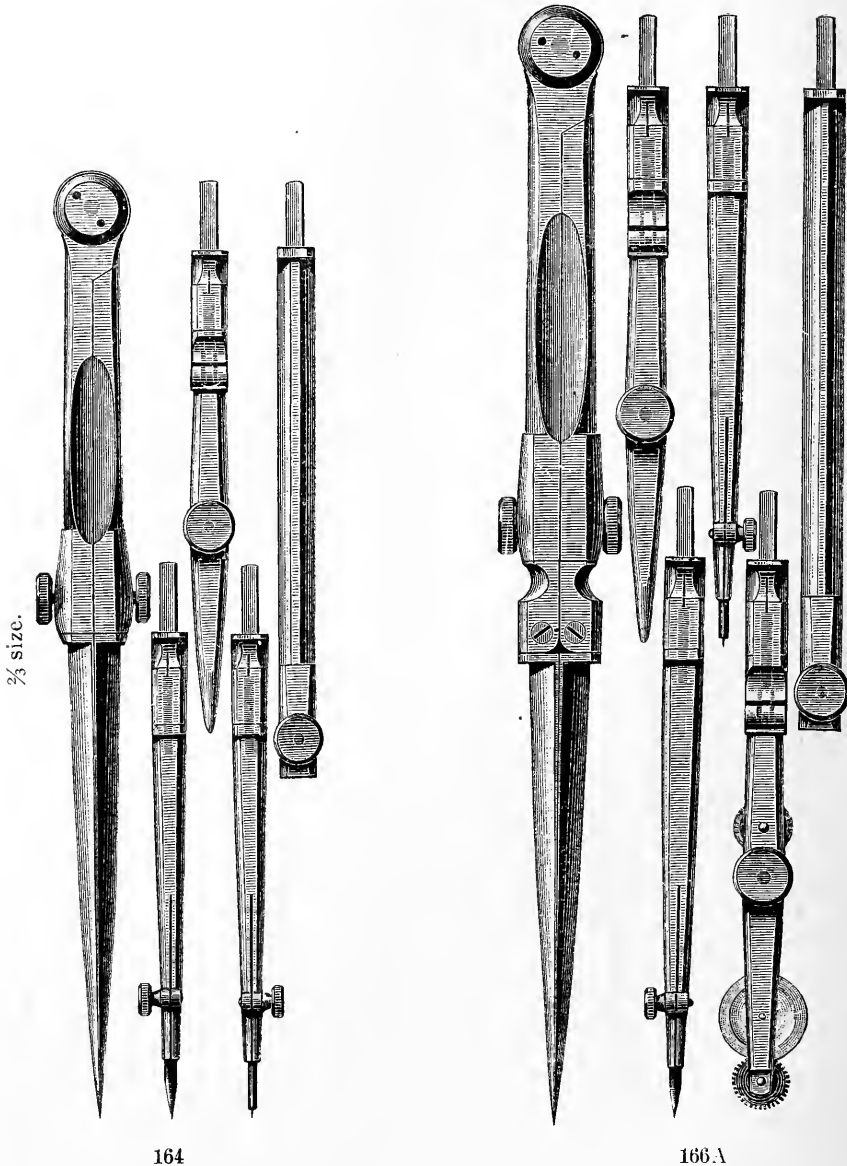


FINEST SWISS INSTRUMENTS.



No.		Each.
157.	Plain Dividers, 5 inch.....	\$2 00
158.	" " 6 "	2 25
159.	Hairspring Dividers, 3 inch, with handle.....	2 25
160.	" " 5 "	2 75
161.	" " 6 "	3 00
162.	Compass, 5½ inch, with fixed needle point, pen, pencil point and lengthening bar.....	6 75
163.	Compass, 4½ inch, with handle, fixed needle point, pen, pencil point and lengthening bar.....	7 00

FINEST SWISS INSTRUMENTS.



No.		Each.
164.	Compass, 6 inch, with pen, pencil, needle point and lengthening bar.....	\$ 8 00
165.	Compass, 6½ inch, with joint in each leg, pen, pencil, needle point and lengthening bar.....	9 25
166.	Compass, 7 inch, with joint in each leg, pen, pencil, needle point, lengthening bar and dotting pen.....	10 75
166A.	Compass, 7 inch, with joint in each leg, pen, pencil, needle point, lengthening bar and dotting pen, with 6 wheels...	12 00

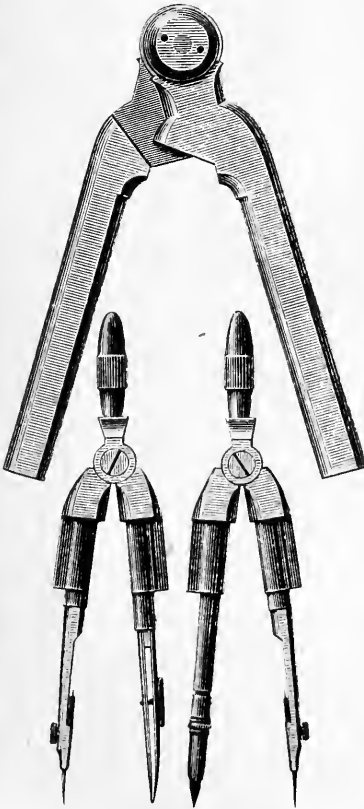


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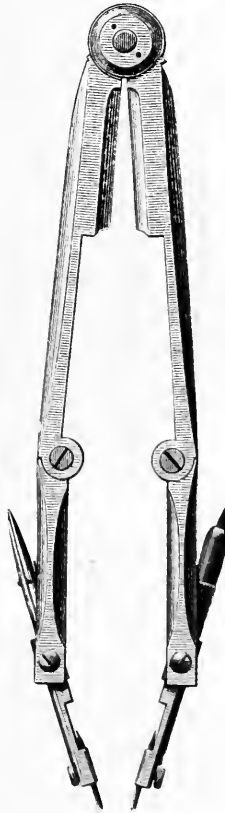
$\frac{2}{3}$ size.



167



168



169

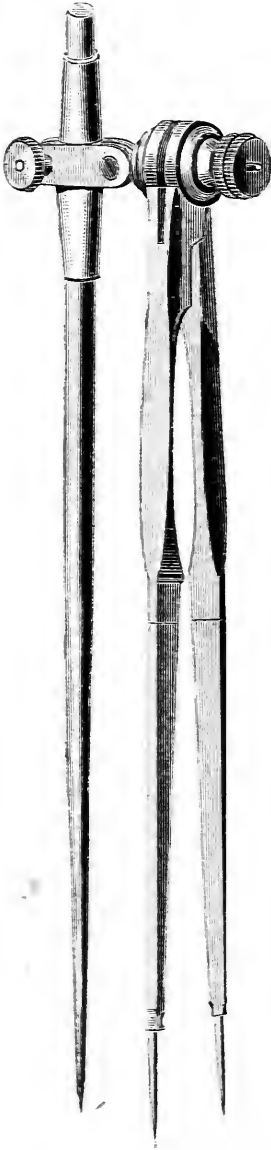


170

No.		Each.
167.	Pocket Dividers, with sheath, $4\frac{1}{2}$ inch.....	\$3 00
168.	Pillar Compass, with handles, pen and pencil points to draw out, forming small bows if required.....	9 50
169.	Pocket Compass, with folding points	9 75
170.	Triangular Compass, for taking off three points.....	5 00

A. H. ABBOTT & CO., CHICAGO.

FINEST SWISS INSTRUMENTS.

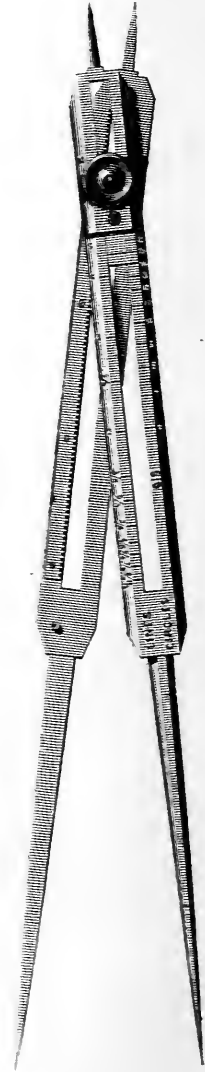


171



172

174 1/2 size.



174

No.		Each.
171.	Triangular Compass, with one adjustable leg, 6 inch.....	\$5 75
172.	Bisecting or Whole and Half Dividers, 7 inch.....	4 00
	Fine Cases for Nos. 167 to 171.....	1 00
173.	Proportional Dividers, finely divided for lines and circles, 8 1/2 inch.....	10 00
174.	Proportional Dividers, finely divided for lines and circles, 8 1/2 inch, with rack movement.....	12 50

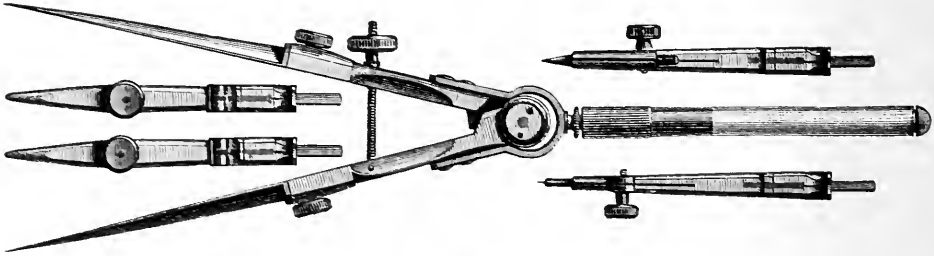
175

178

177.	Bow Pen, with spring and adjusting screw.....	2 50
178.	“ “ “ “ “ “ and pencil point..	3 50
	Cases for Nos. 173 to 176.....	\$1 00 and 1 25



FINEST SWISS INSTRUMENTS.



178-1

- | | | |
|---------------|--|---------------|
| No. | | Each. |
| 178-1. | Steel Spring Bow Dividers , with long ivory handle, two pen points, pencil and needle points..... | \$8 25 |



179



180



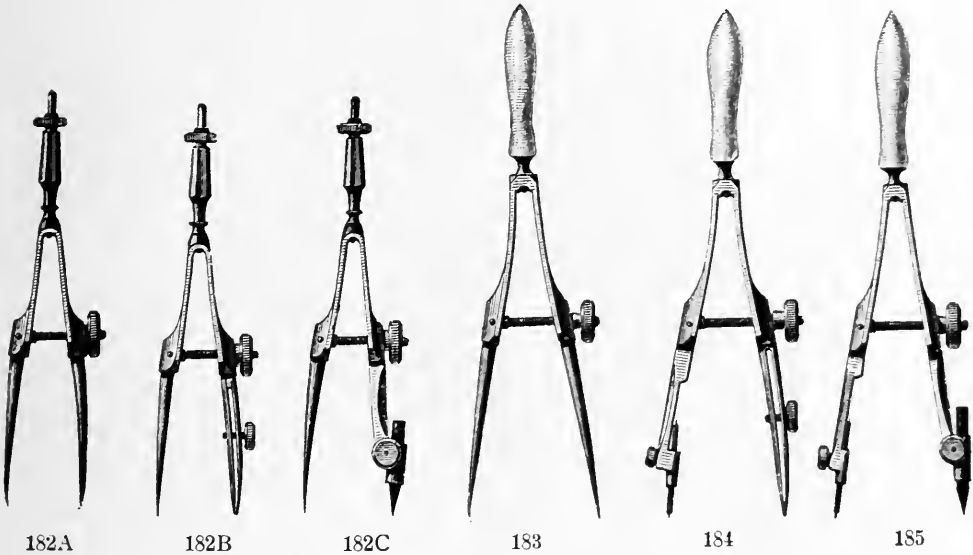
181

- | | | |
|-------------|--|-------------|
| 179. | Steel Spring Bow Pen , with self-adjusting point for very small circles | 4 00 |
| 180. | Steel Spring Bow Pen , for very small circles..... | 4 00 |
| 181. | Steel Spring Bow Pen and Pencil , for very small circles. | 5 00 |
| | Morocco Cases for Nos. 179, 180 and 181..... | 80 |

Nos. 179, 180 and 181 are different from other bows, and are the most excellent instruments for drawing small circles. A small rod passes through the entire instrument, serving as handle and needle point. In Nos. 180 and 181 this center rod remains stationary while the instrument is turned, and pen or pencil draw by their own weight, avoiding the slipping of the needle or scratching of the pen.

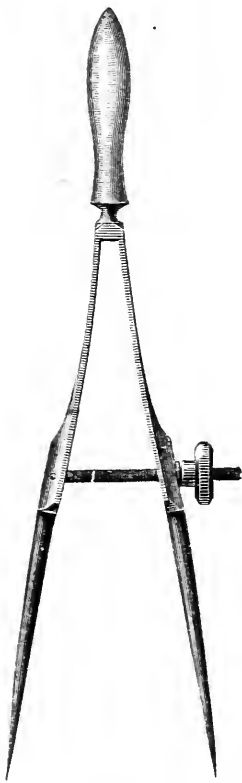


FINEST SWISS INSTRUMENTS.

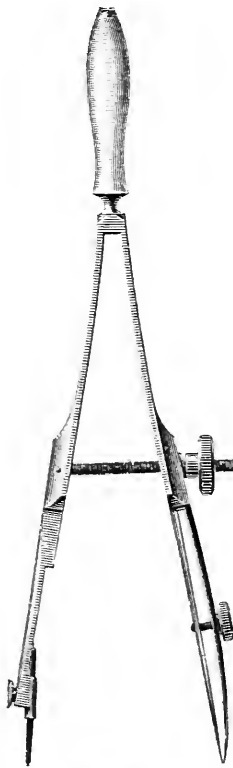


No.							Each.
182.	Minute Steel Spring Dividers and Bows, 3 in set, 2½						
	inch, in case.....						\$7 80
182A.	Minute Steel Spring Bow Dividers, 2½ inch.						2 00
182B.	"	"	"	Pen,	2½ "		2 50
182C.	"	"	"	Pencil,	2½ "		2 50
183.	Steel Spring Bow Dividers, with ivory handle, 3 inch.						2 00
184.	"	"		Pen, with needle point, ivory handle,	3 inch		2 50
185.	"	"		Pencil,	" " " "	3 "	2 50
186.	"	"		Dividers,	" " "	3½ "	2 10
187.	"	"		Pen,	" " " "	3½ "	2 70
188.	"	"		Pencil,	" " " "	3½ "	2 70

FINEST SWISS INSTRUMENTS.



189



190



191

No.		Each.
189.	Steel Spring Bow Dividers, with ivory handle, $4\frac{3}{4}$ inch....	\$2 50
190.	“ “ Pen, with needle point, ivory handle, $4\frac{3}{4}$ in.	3 00
191.	“ “ Pencil, with “ “ “ $4\frac{3}{4}$ “	3 00



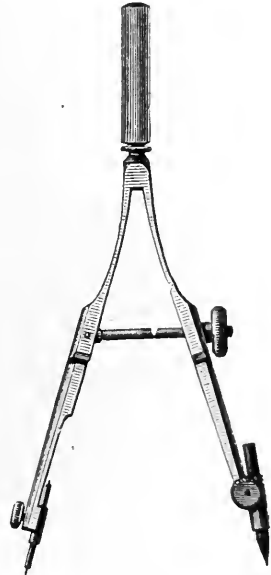
FINEST SWISS INSTRUMENTS.



192



193

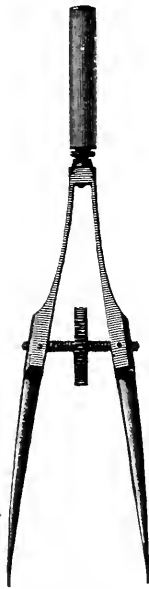


194

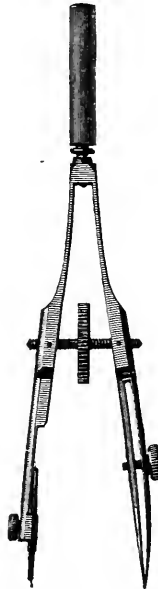
No.		Each.
192.	Steel Spring Bow Dividers, $3\frac{1}{2}$ inch, German silver handle,	\$2 00
193.	“ “ Pen, $3\frac{1}{2}$ inch, with needle point, German silver handle.....	2 50
194.	“ “ Pencil, $3\frac{1}{2}$ inch, with needle point, German silver handle.....	2 50
192B.	“ Bows, set of 3, 192, 193, 194, in morocco case, per set.....	8 00
	Morocco Cases, for sets of 183, 184, 185.....	1 00
	“ “ “ “ 186, 187, 188	1 25
	“ “ “ “ 189, 190, 191	1 50



FINEST SWISS INSTRUMENTS.



192A



193A

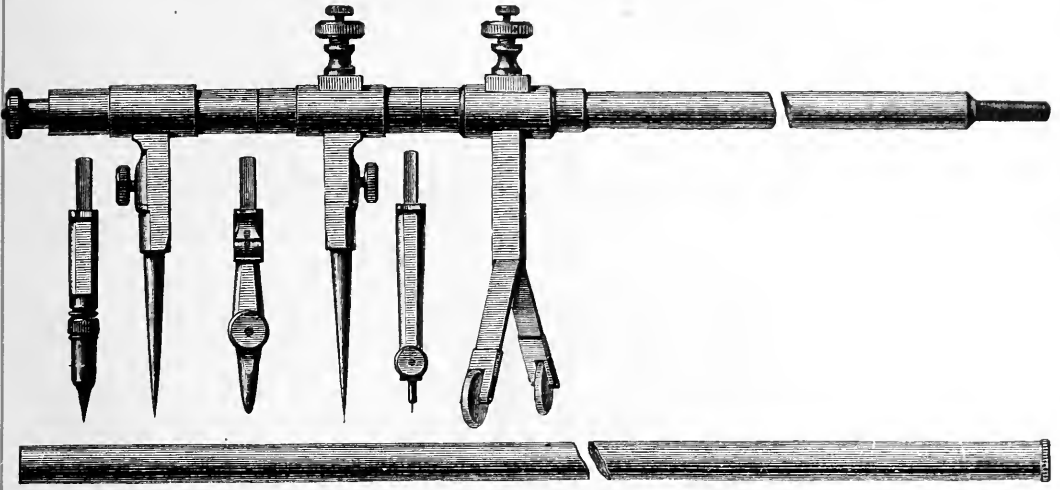


194A

No.		Each.
192A.	Steel Spring Bow Dividers, $3\frac{1}{2}$ inch, German silver handle.....	\$2 40
193A.	Steel Spring Bow Pen, $3\frac{1}{2}$ inch, with needle point, German silver handle.....	3 00
194A.	Steel Spring Bow Pencil, $3\frac{1}{2}$ inch, with needle point, German silver handle.....	3 00
194B.	Steel Spring Bows, set of 3, 192A, 193A, 194A, in morocco case, per set.....	9 75

Steel spring bows Nos. 192A, 193A, 194A have a right and left thread, operated by one thumb nut situated between the shanks of the instrument. They are opened and closed by the screw, which holds the points rigidly in any position.

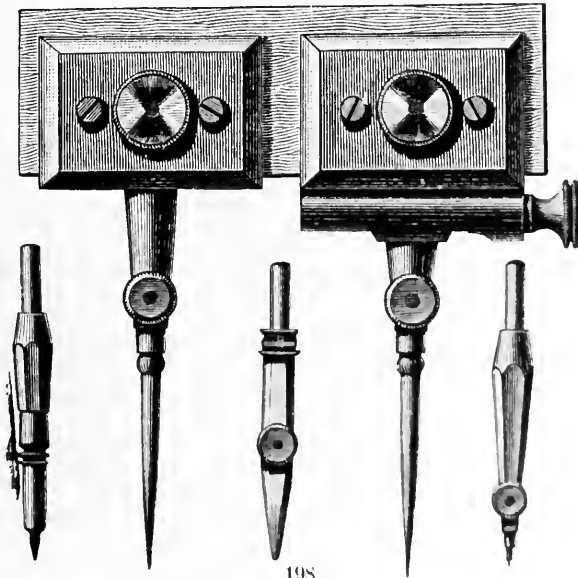
FINEST SWISS INSTRUMENTS.



195

With Wheel Attachment No. 197A.

No.		Each.
195.	Tubular Beam Compass, 18 inch, 2 bars, pen, pencil, needle point and steel points.....	\$10 50
196.	Tubular Beam Compass, 24 inch, 3 bars	11 75
197.	" " " 36 " 3 "	15 25
197A.	Wheel Attachment for Beam Compass, Nos. 195 and 196	2 25
197B.	Wheel Attachment for Beam Compass, No. 197....	2 75

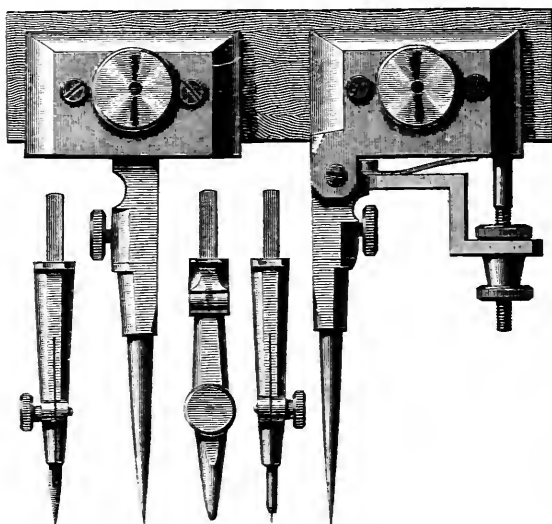


198

- 198.** Fine German Silver Beam Compass, furniture fitting on any flat ruler or bar, with 2 needle points, 1 pen and 1 pencil leg..... 9 00
 Same in fine morocco case..... 10 00



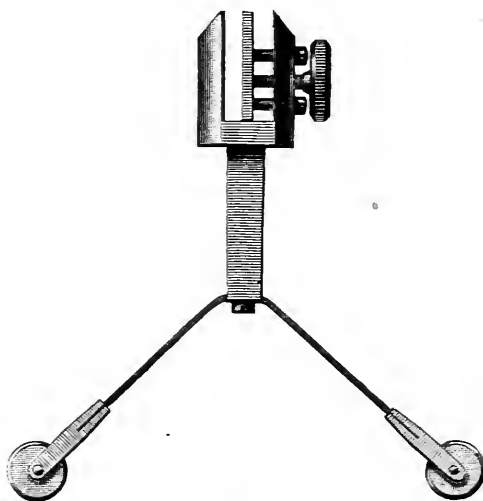
FINEST SWISS INSTRUMENTS.



199

Each.

- | | | | |
|------|--|-------|---------|
| No. | | | |
| 199. | Beam Compass, to fit on any straight edge, with two steel points, pen, pencil, needle points, and micrometer adjustment..... | | \$ 9 00 |
| 200. | Beam Compass, to fit on any straight edge, with two steel points, pen, pencil and needle points, with attachment on wheels to stand by itself..... | 10 80 | |
| | Morocco Case, for 199..... | 1 25 | |
| | “ “ “ 200..... | 1 75 | |

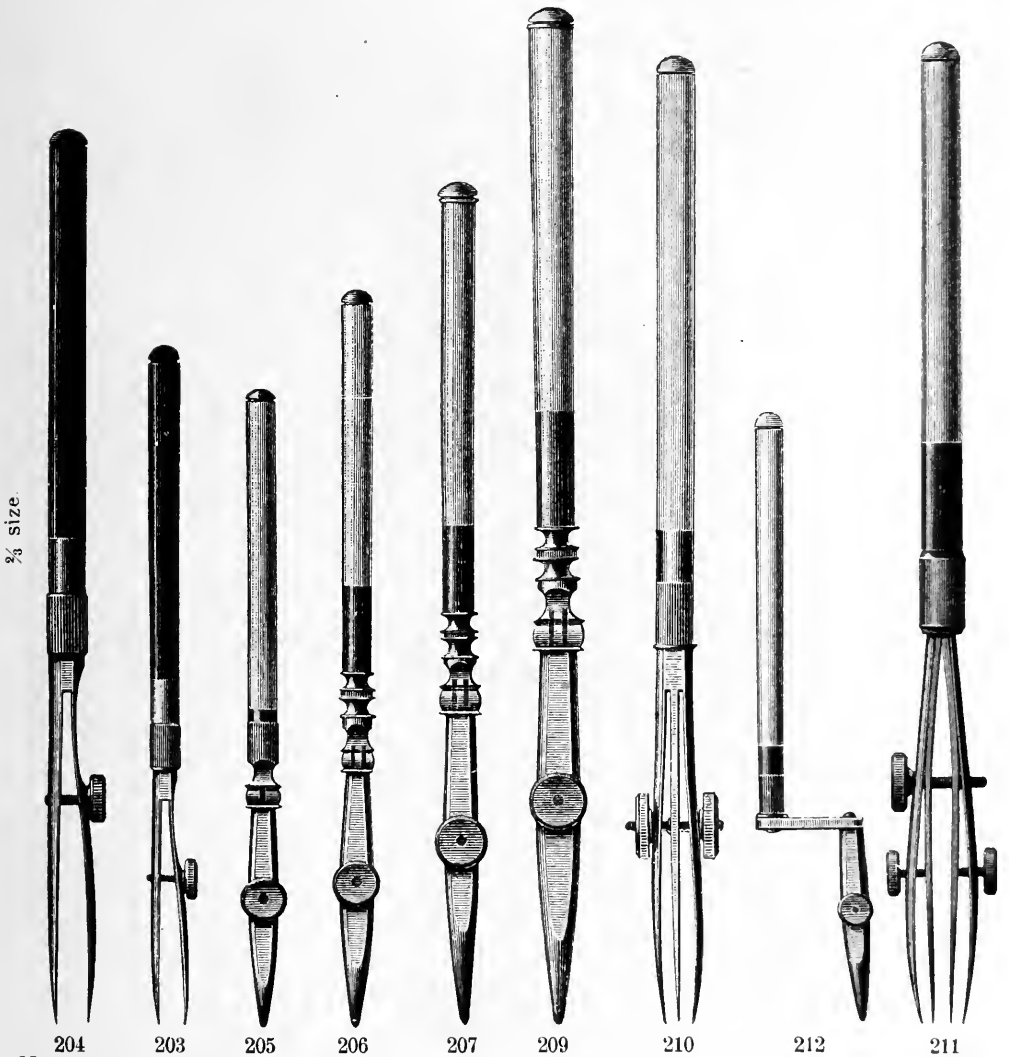


201

- | | | |
|------|--------------------------------|------|
| 201. | Wheel Attachment, for 199..... | 2 25 |
|------|--------------------------------|------|

For Wooden Bars for Beam Compasses, see under Bars for Beam Compasses.

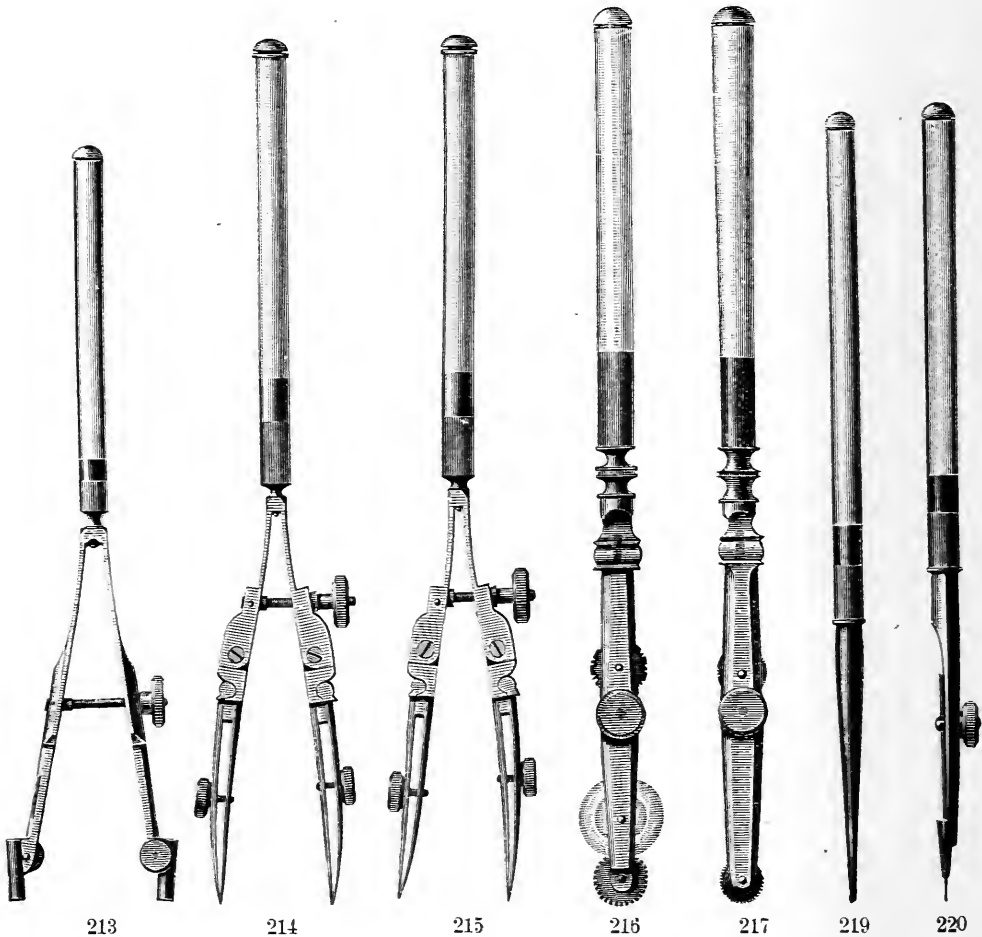
FINEST SWISS INSTRUMENTS.



No.			Each.
203.	Drawing Pen,	with ebony handle, upper blade with spring, 4½ inch.....	\$1 00
204.	"	" with ebony handle, upper blade with spring, 5 inch.....	1 10
205.	"	" with joint, ivory handle, 4 inch.....	1 40
206.	"	" " and pin, ivory handle, 4½ inch...	1 60
207.	"	" " " " " " 5½ " ...	1 80
208.	"	" " " " " " German silver blades, 5½ inch.....	1 80
209.	"	" with joint and pin, ivory handle, 6 inch.....	2 00
210.	Border Pen,	for broad lines, 6½ inch.....	3 00
211.	"	" " " " improved, 6½ inch.....	3 50
212.	Curve Pen,	4½ inch.....	1 25
213.	Railroad Pencil.....		3 25

Border Pen No. 211 may also be used as Railroad Pen by filling only the two outer pairs of blades with ink. Drawing Pens carefully set and sharpened, each, 20 to 25 cents.

FINEST SWISS INSTRUMENTS.

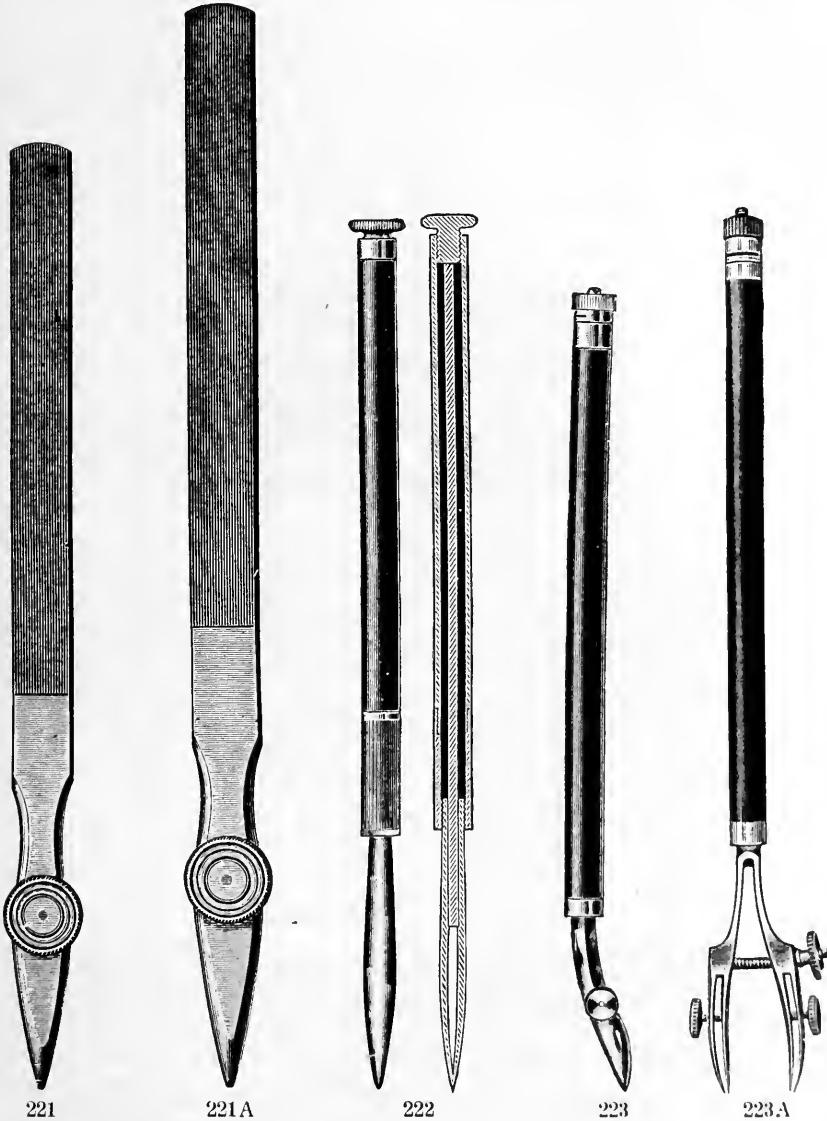


No.		Each.
214.	Railroad Pen, with ivory handle, $5\frac{1}{2}$ inch.....	\$3 50
215.	" " improved, $5\frac{1}{2}$ inch	3 75
The improvement of this instrument consists in having both pens bent in the same direction, and therefore lines can be drawn against straight edges and rules as perfect as with a ruling pen.		
216.	Dotting Pen, with 6 wheels, 6 inch.....	3 75
217.	" " " 6 " improved, 6 inch.....	4 25
The Improved Dotting Pen No. 217 is highly prized, as it entirely prevents blotting. The reservoir, after being filled, is closed, and through a minute opening allows no more ink to the dotting wheel than is actually needed.		
218.	Opisometer, for measuring curved lines.....	1 80
219.	Tracer.....	90
220.	Pricker.....	1 50

Drawing Pens carefully set and sharpened, each 20 to 25 cents.



FINEST SWISS INSTRUMENTS.



- | No. | | Each. |
|-------|--|--------|
| 221. | Swedish Style Drawing Pen, for long lines, 5 inch..... | \$1 35 |
| 221A. | " " " " " " 6 inch..... | 1 50 |
| 222. | Improved Drawing Pen, 5½ inch..... | 1 45 |
| | This pen is opened and closed by turning screw at upper end of blade. | |
| 223. | Improved Curve Pen, 5 inch..... | 1 50 |
| | The handle of this pen is hollow. A rod turns in the handle. At upper end of handle is a small screw to clamp or loosen the pen, so as to make the smallest curve with great accuracy. | |
| 223A. | Improved Railroad Pen, 5½ inch..... | 5 00 |
| | A rod is revolving in the hollow handle of the pen. By turning screw which is attached to upper end of handle, the pen is clamped for straight or loosened for curved lines. | |

Drawing Pens carefully set and sharpened, each, 20 to 25 cents.

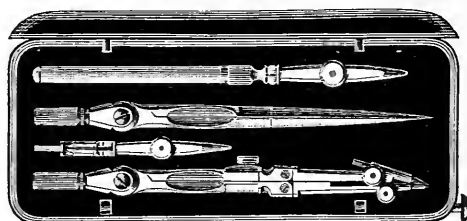


FINEST SWISS INSTRUMENTS.

In Fine Morocco Cases, Lined with Silk Velvet.

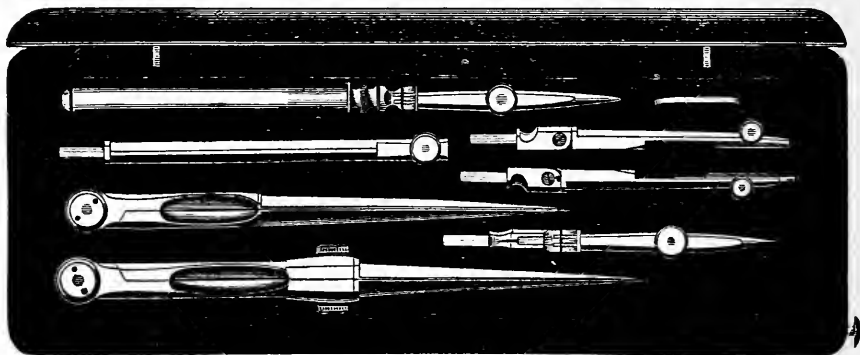
This list comprises a selection of the most desirable assortments of finest Swiss instruments in morocco pocket cases.

Special cases of instruments fitted to order.



224.

- | No. | | Each. |
|------|---|---------|
| 224. | Pocket Case , containing compass, $3\frac{1}{2}$ inch, with fixed needle point, pen and pencil point, No. 154.
Plain dividers, with handle, $3\frac{1}{2}$ inch, No. 152.
Drawing pen, $4\frac{1}{2}$ inch, joint, pin and ivory handle, No. 206.. | \$ 9 60 |
| 225. | Pocket Case , containing compass, 6 inch, with pen, pencil, needle point and lengthening bar, No. 164.
Drawing pen, $5\frac{1}{2}$ inch, joint, pin and ivory handle, No. 207.. | 11 50 |



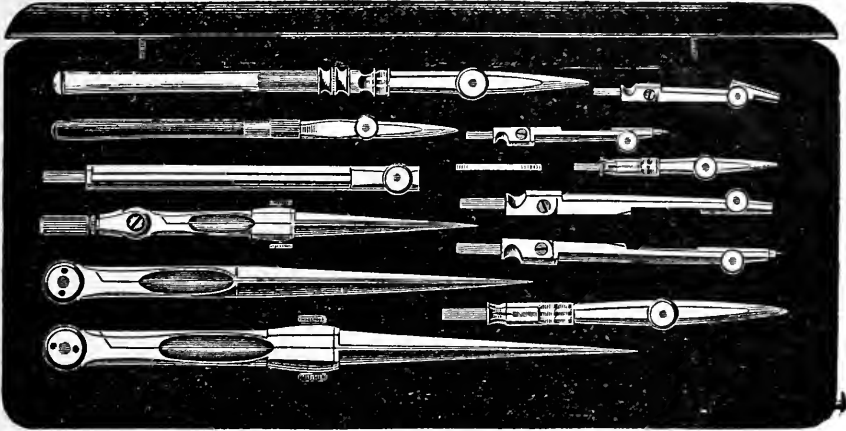
226

- 226. Pocket Case**, containing compass, 6-inch, with pen, pencil, needle point and lengthening bar, No. 164.
Plain dividers, 5 inch, No. 157.
Drawing pen, $5\frac{1}{2}$ inch, joint, pin and ivory handle, No. 207.. 13 75



FINEST SWISS INSTRUMENTS.

In Fine Morocco Cases, Lined with Silk Velvet.



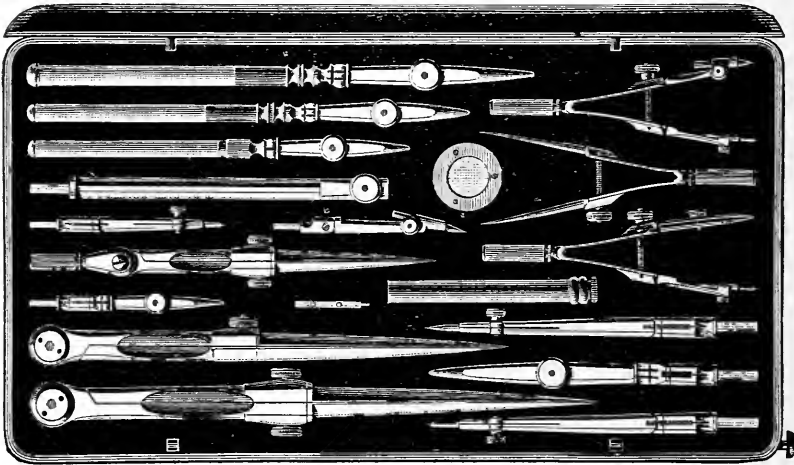
227

- | No. | | Each. |
|------|---|---------|
| 227. | Pocket Case , containing compass, 6 inch, with pen, pencil, needle point and lengthening bar, No. 164.
Compass, $3\frac{1}{2}$ inch, with pen, pencil and needle point, No. 153.
Plain dividers, 5 inch, No. 157.
Drawing pen, $5\frac{1}{2}$ in., with joint, pin and ivory handle, No. 207.
Drawing pen, $4\frac{1}{2}$ inch, ebony handle, No. 203..... | \$20 25 |
| 228. | Pocket Case , containing compass, 6 inch, with pen, pencil, needle point and lengthening bar, No. 164.
Hairspring dividers, 5 inch, No. 160.
Steel spring bow dividers, 3 inch, ivory handle, No. 183.
Steel spring bow pen, 3 inch, ivory handle, No. 184.
Steel spring bow pencil, 3 inch, ivory handle, No. 185.
Drawing pen, $4\frac{1}{2}$ in., with joint, pin and ivory handle, No. 206.
Drawing pen, $5\frac{1}{2}$ in., with joint, pin and ivory handle, No. 207.
German silver lead box..... | 24 00 |
| 229. | Pocket Case , containing compass, $6\frac{1}{2}$ inch, with joint in each leg, pen, pencil, needle point and lengthening bar, No. 165.
Compass, $3\frac{1}{2}$ inch, fixed needle point, pen and pencil points, No. 154.
Large steel spring dividers, ivory handle, No. 189.
Steel spring bow pen, $3\frac{1}{2}$ inch, ivory handle, No. 187.
Drawing pen, $4\frac{1}{2}$ inch, joint, pin and ivory handle, No. 206.
Drawing pen, $5\frac{1}{2}$ inch, joint, pin and ivory handle, No. 207.
Drawing pen, 6 inch, joint, pin and ivory handle, No. 207.
German silver lead box..... | 29 00 |

FINEST SWISS INSTRUMENTS.

In Fine Morocco Cases, Velvet Lined.

No.		Each.
230.	Pocket Case , containing compass, $5\frac{1}{2}$ inch, with fixed needle point, pen, pencil point and lengthening bar, No. 162. Hairspring dividers, 5 inch, No. 160. Compass, $3\frac{1}{2}$ inch, fixed needle point, pen and pencil point, No. 154. Drawing pen, $4\frac{1}{2}$ inch, joint, pin and ivory handle, No. 206. Drawing pen, $5\frac{1}{2}$ inch, joint, pin and ivory handle, No. 207. Steel spring bow dividers, $3\frac{1}{2}$ inch, ivory handle, No. 186. Steel spring bow pen, $3\frac{1}{2}$ inch, ivory handle, No. 187. Steel spring bow pencil, $3\frac{1}{2}$ inch, ivory handle, No. 188. German silver lead box.....	\$31 00



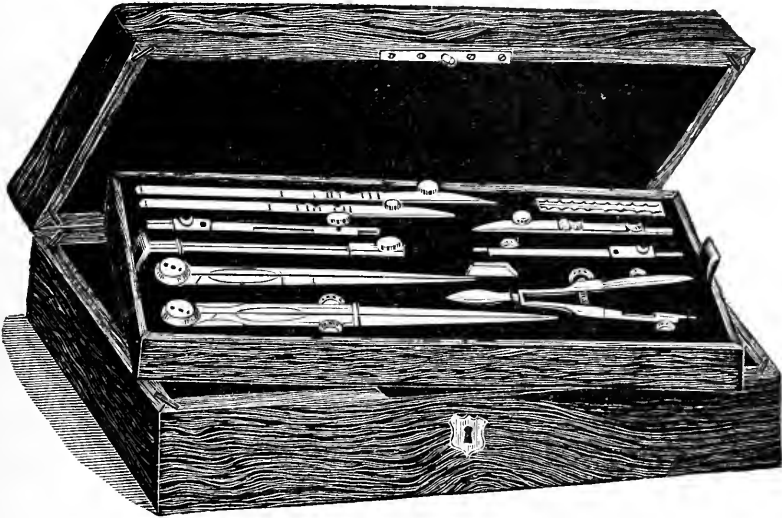
231

231.	Pocket Case , containing compass, 6 inch, with pen, pencil, needle point and lengthening bar, No. 164. Hairspring dividers, 5 inch, No. 160. Compass, $3\frac{1}{2}$ inch, with pen, pencil and needle point, No. 153. Drawing pen, 4 inch, with joint, ivory handle, No. 205. Drawing pen, $4\frac{1}{2}$ in., with joint and pin, ivory handle, No. 206. Drawing pen, $5\frac{1}{2}$ in., with joint and pin, ivory handle, No. 207. Steel spring bow dividers, $3\frac{1}{2}$ in., German silver handle, No. 192. Steel spring bow pen, $3\frac{1}{2}$ in., German silver handle, No. 193. Steel spring bow pencil, $3\frac{1}{2}$ in., German silver handle, No. 194. Horn center and German silver lead box	3 00
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FINEST SWISS INSTRUMENTS.

In Polished Rosewood Cases, with Lock and Tray. Tray lined with Silk Velvet.



No.

240

Each.

- 240. Polished Rosewood Case**, containing compass, 6 inch, with pen, pencil, needle point and lengthening bar, No. 164. Plain dividers, 5 inch, No. 157. Drawing pen, $4\frac{1}{2}$ in., with joint, pin and ivory handle, No. 206. Drawing pen, $5\frac{1}{2}$ in., with joint, pin and ivory handle, No. 207. German silver lead box.....\$20 75



241.

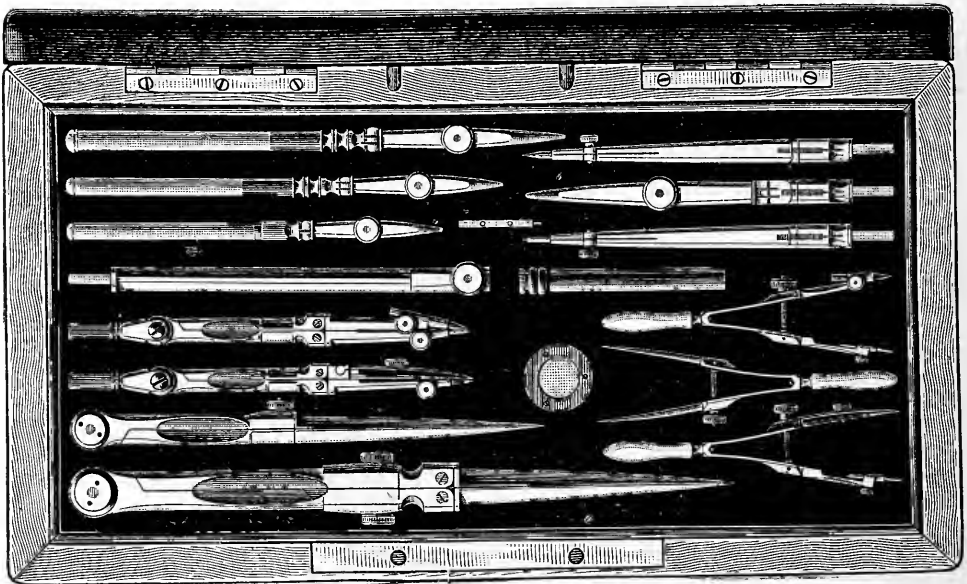
- 241. Polished Rosewood Case**, containing compass, 6 inch, with pen, pencil, needle point and lengthening bar, No. 164. Compass, $3\frac{1}{2}$ inch, with pen, pencil and needle point, No. 153. Plain dividers, 5 inch, No. 157. Drawing pen, $4\frac{1}{2}$ inch, ebony handle, No. 203. Drawing pen, $5\frac{1}{2}$ in., with joint and pin, ivory handle, No. 207. German silver lead box..... 26 95



FINEST SWISS INSTRUMENTS.

In Polished Rosewood Cases, with Lock and Tray. Tray Lined with Silk Velvet.

No.	Each.
242.	Polished Rosewood Case, containing compass, $6\frac{1}{2}$ inch, with joint in each leg, pen, pencil, needle point and lengthening bar, No. 165.
	Compass, $3\frac{1}{2}$ inch, with fixed needle point, pen and pencil point, No. 154.
	Large steel spring dividers, ivory handle, No. 189.
	Steel spring bow pen, $3\frac{1}{2}$ inch, ivory handle, No. 187.
	Drawing pen, $4\frac{1}{2}$ inch, with joint and pin, ivory handle, No. 206.
	Drawing pen, $5\frac{1}{2}$ inch, with joint and pin, ivory handle, No. 207.
	Drawing pen, 6 inch, with joint and pin, ivory handle, No. 209.
	German silver lead box.....\$33 00



248.

FINEST SWISS INSTRUMENTS.

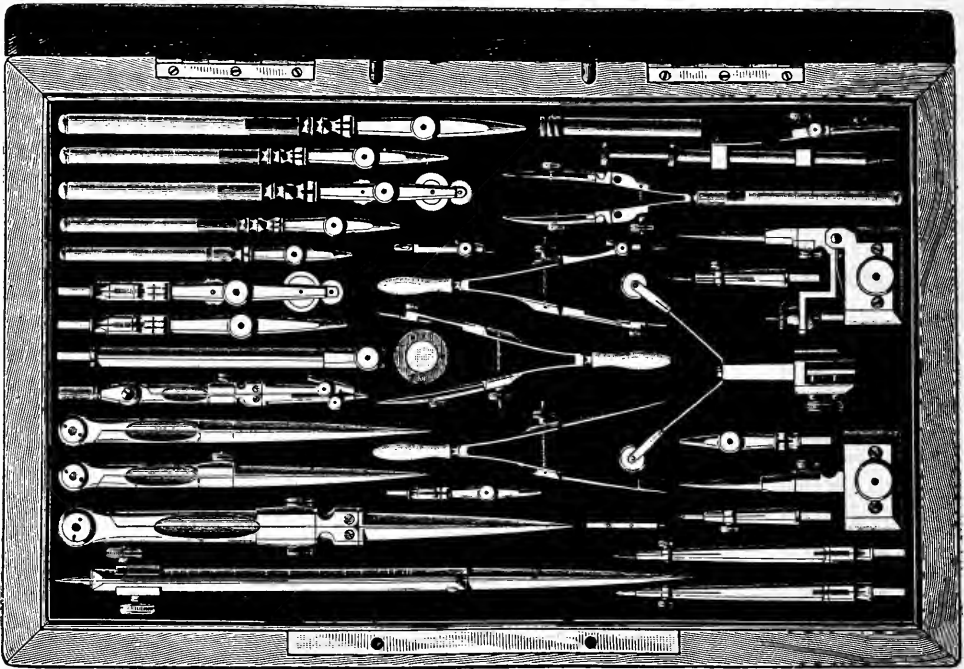
In Polished Rosewood Cases, with Lock and Tray. Tray Lined with Silk Velvet.

- | No. | Each |
|---|---------|
| 243. Polished Rosewood Case, containing compass $6\frac{1}{2}$ inch,
with pen, pencil, needle point and lengthening bar, No. 165.
Hairspring dividers, 5 inch, No. 160.
Compass, $3\frac{1}{2}$ inch, fixed needle and pen point, No. 155.
Compass, $3\frac{1}{2}$ inch, fixed needle and pencil point, No. 156.
Drawing pen, 4 inch, with joint, ivory handle, No. 205.
Drawing pen, $4\frac{1}{2}$ inch, with joint and pin, ivory handle, No. 206.
Drawing pen, $5\frac{1}{2}$ inch, with joint and pin, ivory handle, No. 207.
Steel spring bow dividers, 3 inch, ivory handle, No. 183.
Steel spring bow pen, 3 inch, ivory handle, No. 184.
Steel spring bow pencil, 3 inch, ivory handle, No. 185.
Horn center and German silver lead box..... | \$39 00 |
| 244. Polished Rosewood Case, containing compass, $6\frac{1}{2}$ inch,
with joint in each leg, pen, pencil, needle point and
lengthening bar, No. 165.
Compass, $3\frac{1}{2}$ inch, with pen, pencil and needle point, No. 153.
Plain dividers, 6 inch, No. 158.
Hairspring dividers, 5 inch, No. 160.
Large steel spring dividers, ivory handle, No. 189.
Steel spring bow pen, $3\frac{1}{2}$ inch, ivory handle, No. 187.
Beam Compass, with pen, pencil, needle point and two steel
points, No. 199.
Drawing pen, $4\frac{1}{2}$ inch, pin, joint and ivory handle, No. 206.
Drawing pen, $5\frac{1}{2}$ inch, pin, joint and ivory handle, No. 207.
Drawing pen, 6 inch, pin, joint and ivory handle, No. 209.
German silver lead box..... | 47 60 |



FINEST SWISS INSTRUMENTS.

In Polished Rosewood Cases, with Lock and Tray. Tray Lined with Silk Velvet.



245

No.

Each

- 245. Polished Rosewood Case**, containing compass, 7 inch, with joint in each leg, pen, pencil, needle point, lengthening bar and dotting pen with 6 wheels, No. 166 A.

Plain dividers, 5 inch, No. 157.

Hairspring dividers, 5 inch, No. 160.

Compass, $3\frac{1}{2}$ inch, fixed needle point, pen and pencil points, No. 154.

Drawing pen, 4 inch, with joint and ivory handle, No. 205.

Drawing pen, $4\frac{1}{2}$ inch, with joint, pin and ivory handle, No. 206.

Drawing pen, $5\frac{1}{2}$ inch, with joint, pin and ivory handle, No. 207.

Drawing pen, 6 inch, with joint, pin and ivory handle, No. 209.

Dotting pen, 6 inch, No. 216.

Steel spring bow pen and pencil, No. 181.

Steel spring bow dividers, $3\frac{1}{2}$ inch, ivory handle, No. 186.

Steel spring bow pen, $3\frac{1}{2}$ inch, ivory handle, No. 187.

Steel spring bow pencil, $3\frac{1}{2}$ inch, ivory handle, No. 188.

Railroad pen, $5\frac{1}{2}$ inch, ivory handle, No. 215.

Proportional dividers, $8\frac{1}{2}$ inch, for lines and circles, with rack movement, No. 174.

Beam compass, with pen, pencil, needle point, two steel points and micrometer adjustment, No. 199.

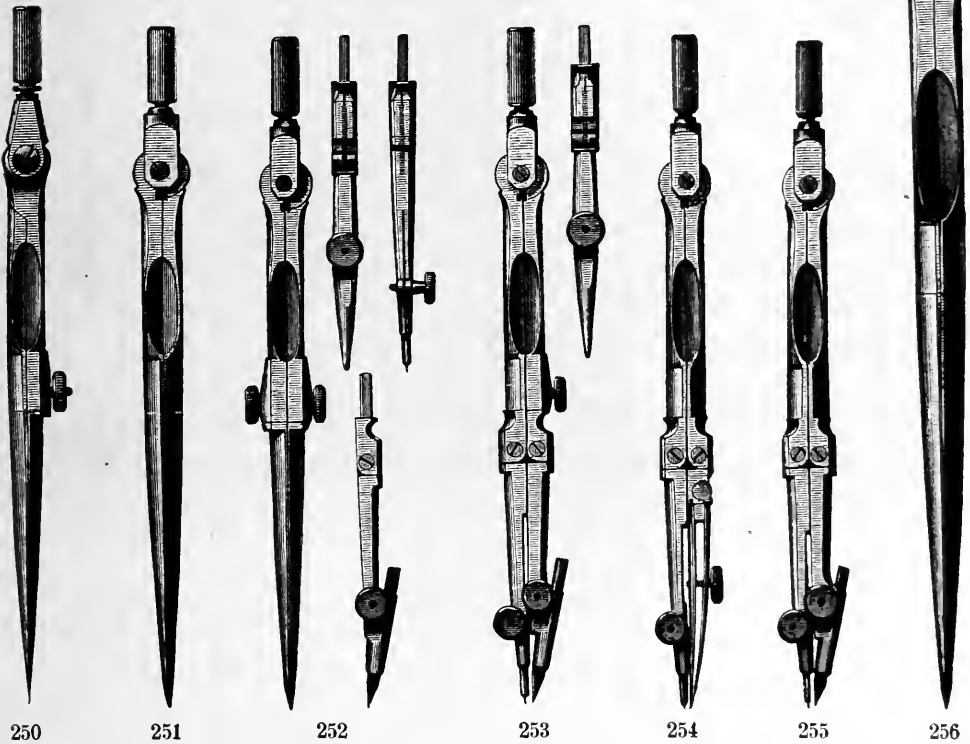
Wheel attachment for same, No. 201.

Horn center and German silver lead box.....\$81 50

Cases containing special assortments of instruments, selected by customers, or larger cases, holding also scales, colors, brushes and saucers, made to order.

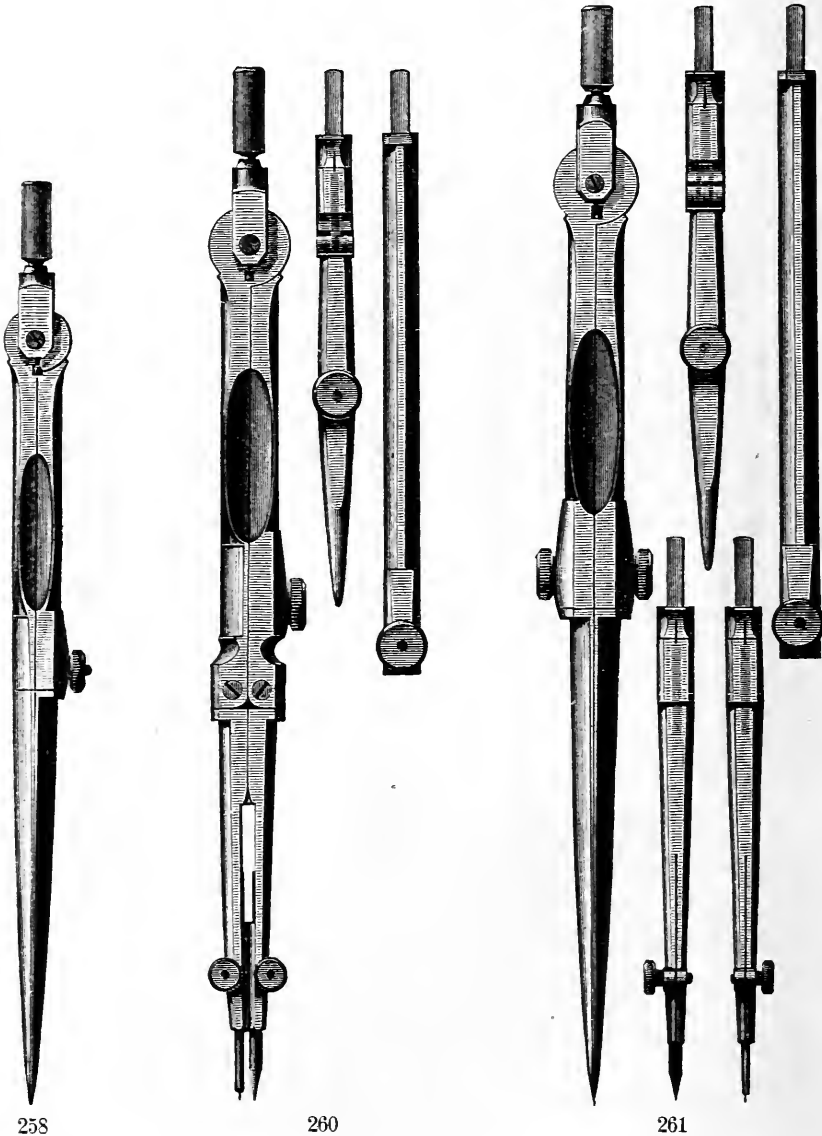
FINEST SWISS INSTRUMENTS.

Dividers and Compasses with Pivot Joints.



No.		Each.
250.	Hairspring Dividers, $3\frac{1}{2}$ inch.....	\$3 00
251.	Dividers, $3\frac{1}{2}$ inch	2 25
252.	Compass, $3\frac{1}{2}$ inch, with pen, pencil, and needle points.....	7 00
253.	" $3\frac{1}{2}$ " " fixed needle point, pen and pencil points.....	6 00
254.	" $3\frac{1}{2}$ " " fixed needle and pen points (bow pen)	4 25
255.	" $3\frac{1}{2}$ " " fixed needle and pencil points (bow pencil)	4 25
256.	Dividers, 5 inch	2 75

FINEST SWISS INSTRUMENTS.



No.		Each.
257.	Dividers, 6 inch.....	\$3 25
258.	Hair spring Dividers, 5 inch.....	3 50
259.	" " " 6 "	4 00
260.	Compass, 6 inch, with fixed needle point, pen, pencil points and lengthening bar	7 50
261.	Compass, 6 inch, with pen, pencil, needle point and length- ening bar	8 50

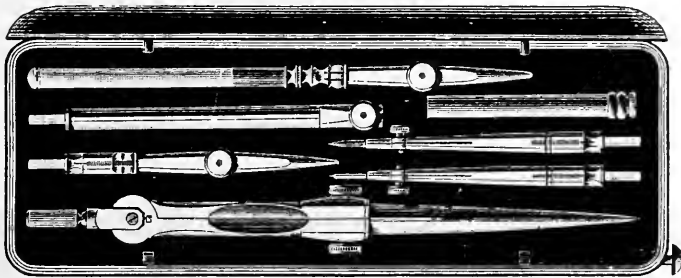
Steel spring bow dividers, $3\frac{1}{2}$ inch, No. 192; steel spring bow pen, $3\frac{1}{2}$ inch, No. 193; steel spring bow pencil, $3\frac{1}{2}$ inch, No. 194; drawing pen, $4\frac{1}{2}$ inch, No. 203; and drawing pen, $5\frac{1}{2}$ inch, No. 204, will match the pivot joint instruments.



FINEST SWISS INSTRUMENTS.

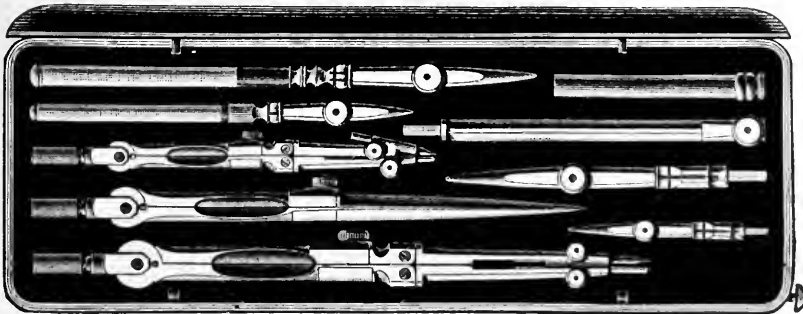
In Fine Morocco Cases, Lined with Silk Velvet.

Dividers and Compasses with Pivot Joint.



264

- | No. | Each. |
|--|---------|
| 264. Pocket Case, containing compass, 6 inch, with pen, pencil, needle point and lengthening bar, No. 261.
Drawing pen, 5½ inch, with joint and pin, ivory handle, No. 207.
German silver lead box..... | \$12 00 |



265

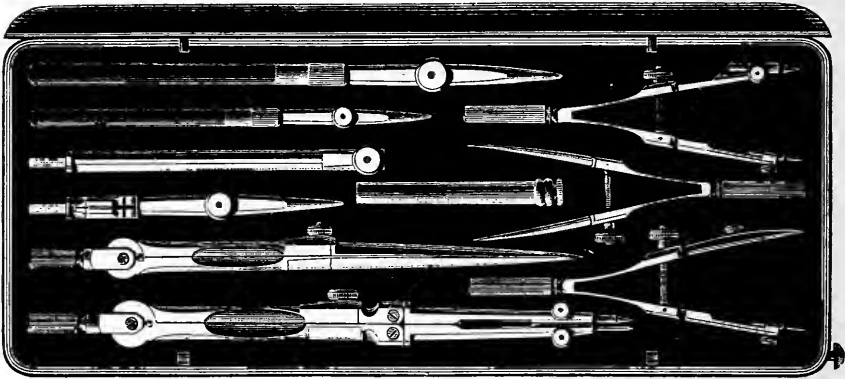
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|--|-------|
| 265. Pocket Case, containing compass, 6 inch, with fixed needle point, pen, pencil point and lengthening bar, No. 260.
Hairspring dividers, 5 inch, No. 258.
Compass, 3½ inch, with fixed needle point, pen and pencil point, No. 253.
Drawing pen, 4 inch, with joint and ivory handle, No. 205.
Drawing pen, 5½ inch, with joint, pin and ivory handle, No. 207.
German silver lead box..... | 21 50 |
|--|-------|



FINEST SWISS INSTRUMENTS.

In Fine Morocco Cases, Lined with Silk Velvet.

Dividers and Compasses with Pivot Joint.



266

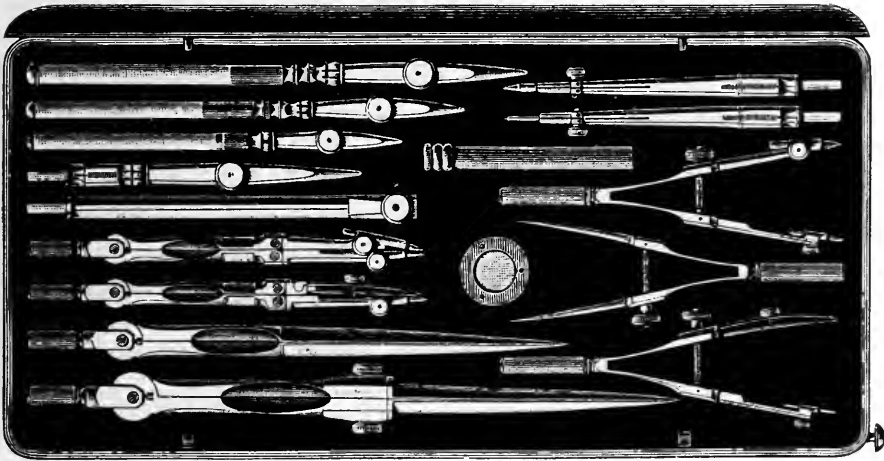
- | No. | | Each. |
|-------------|---|---------|
| 266. | Pocket Case , containing compass, 6 inch, with fixed needle point, pen, pencil point and lengthening bar, No. 260. Hairspring dividers, 5 inch, No. 258. Drawing pen, $4\frac{1}{2}$ inch, ebony handle, No. 203. Drawing pen, $5\frac{1}{2}$ inch, ebony handle, No. 204. Steel spring bow dividers, $3\frac{1}{2}$ inch, German silver handle, No. 192. Steel spring bow pen, $3\frac{1}{2}$ inch, German silver handle, No. 193. Steel spring bow pencil, $3\frac{1}{2}$ inch, German silver handle, No. 194. German silver lead box..... | \$22 50 |

For instruments in set No. 266 we recommend our folding pocket case, No. 429, as illustrated and described under No. 429 of this catalogue.

FINEST SWISS INSTRUMENTS.

In Fine Morocco Cases, Lined with Silk Velvet.

Dividers and Compasses with Pivot Joint.



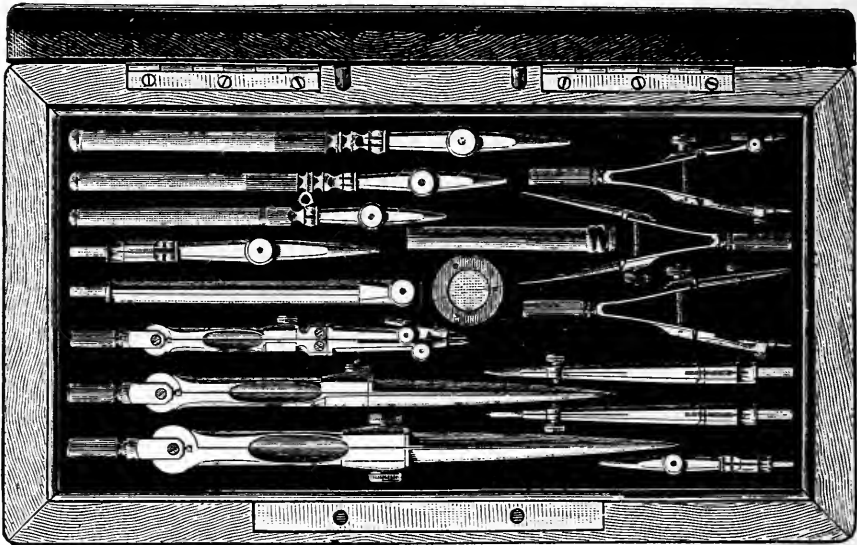
267.

- | No. | Each. |
|--|---------|
| 267. Pocket Case, containing compass, 6 inch, with pen, pencil, needle point and lengthening bar, No. 261.
Plain dividers, 5 inch, No. 256.
Compass, $3\frac{1}{2}$ inch, fixed needle and pen points, No. 254.
Compass, $3\frac{1}{2}$ inch, fixed needle and pencil points, No. 255.
Drawing pen, 4 inch, with joint, ivory handle, No. 205.
Drawing pen, $4\frac{1}{2}$ inch, with joint and pin, ivory handle, No. 206.
Drawing pen, $5\frac{1}{2}$ inch, with joint and pin, ivory handle, No. 207.
Bow dividers, $3\frac{1}{2}$ inch, German silver handle, No. 192.
Bow pen, $3\frac{1}{2}$ inch, German silver handle, No. 193.
Bow pencil, $3\frac{1}{2}$ inch, German silver handle, No. 194.
Horn center and German silver lead box..... | \$35 00 |

FINEST SWISS INSTRUMENTS.

In Polished Rosewood Cases, with Lock and Tray. Tray Lined with Silk Velvet.

Dividers and Compasses with Pivot Joint.



268.

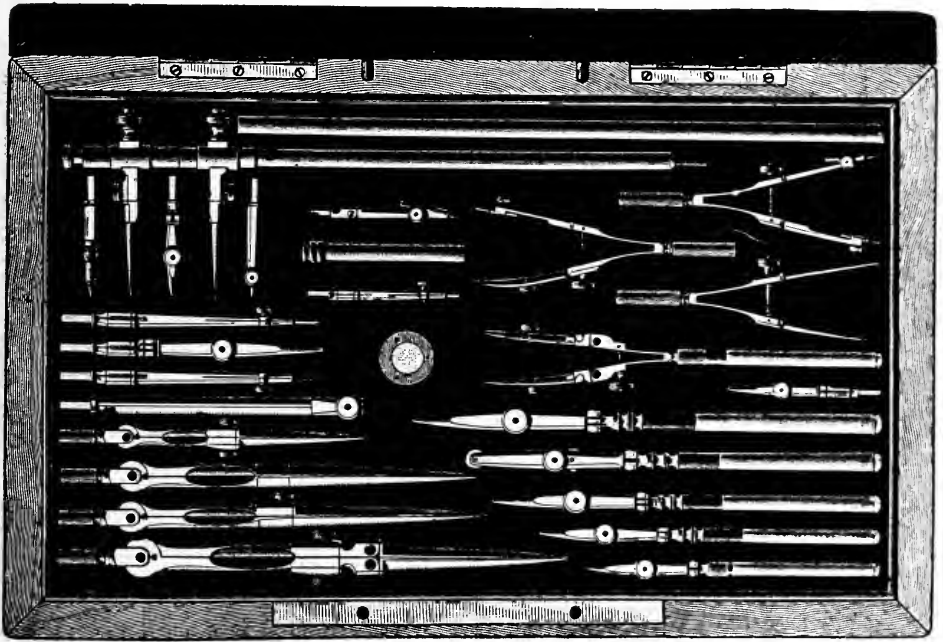
- | | |
|--|----------------|
| No. | Each. |
| 268. Polished Rosewood Case , containing compass, 6 inch, with pen, pencil, needle point and lengthening bar, No. 261. Hairspring dividers, 5 inch, No. 258. Compass, $3\frac{1}{2}$ inch, with fixed needle point, pen and pencil points, No. 253. Drawing pen, 4 inch, with joint and ivory handle, No. 205. Drawing pen, $4\frac{1}{2}$ inch, with joint, pin and ivory handle, No. 206. Drawing pin, $5\frac{1}{2}$ inch, with joint, pin and ivory handle, No. 207. Steel spring bow dividers, $3\frac{1}{2}$ inch, German silver handle, No. 192. Steel spring bow pen, $3\frac{1}{2}$ inch, German silver handle, No. 193. Steel spring bow pencil, $3\frac{1}{2}$ inch, German silver handle, No. 194. Horn center and German silver lead box | |
| | \$37 55 |



FINEST SWISS INSTRUMENTS.

In Polished Rosewood Cases, with Lock and Tray. Tray Lined with Silk Velvet.

Dividers and Compasses with Pivot Joint.



269

No.

Each.

269. Polished Rosewood Case, containing compass, 6 inch, joint in each leg, pen, pencil, needle point and lengthening bar, like 261.

Plain dividers, 5 inch, No. 256.

Hairspring dividers, 5 inch, No. 258.

Compass, $3\frac{1}{2}$ inch, pen, pencil and needle point, No. 252.

Drawing pen, 4 inch, with joint and ivory handle, No. 205.

Drawing pen, $4\frac{1}{2}$ inch, with joint, pin and ivory handle, No. 206.

Drawing pen, $5\frac{1}{2}$ inch, with joint, pin and ivory handle, No. 207.

Drawing pen, 6 inch, with joint, pin and ivory handle, No. 209.

Railroad pen, $5\frac{1}{2}$ inch, No. 215.

Dotting pen, 6 inch, with 6 wheels, No. 217.

Steel spring bow dividers, $3\frac{1}{2}$ inch, German silver handle, No. 192.

Steel spring bow pen, $3\frac{1}{2}$ inch, German silver handle, No. 193.

Steel spring bow pencil, $3\frac{1}{2}$ inch, German silver handle, No. 194.

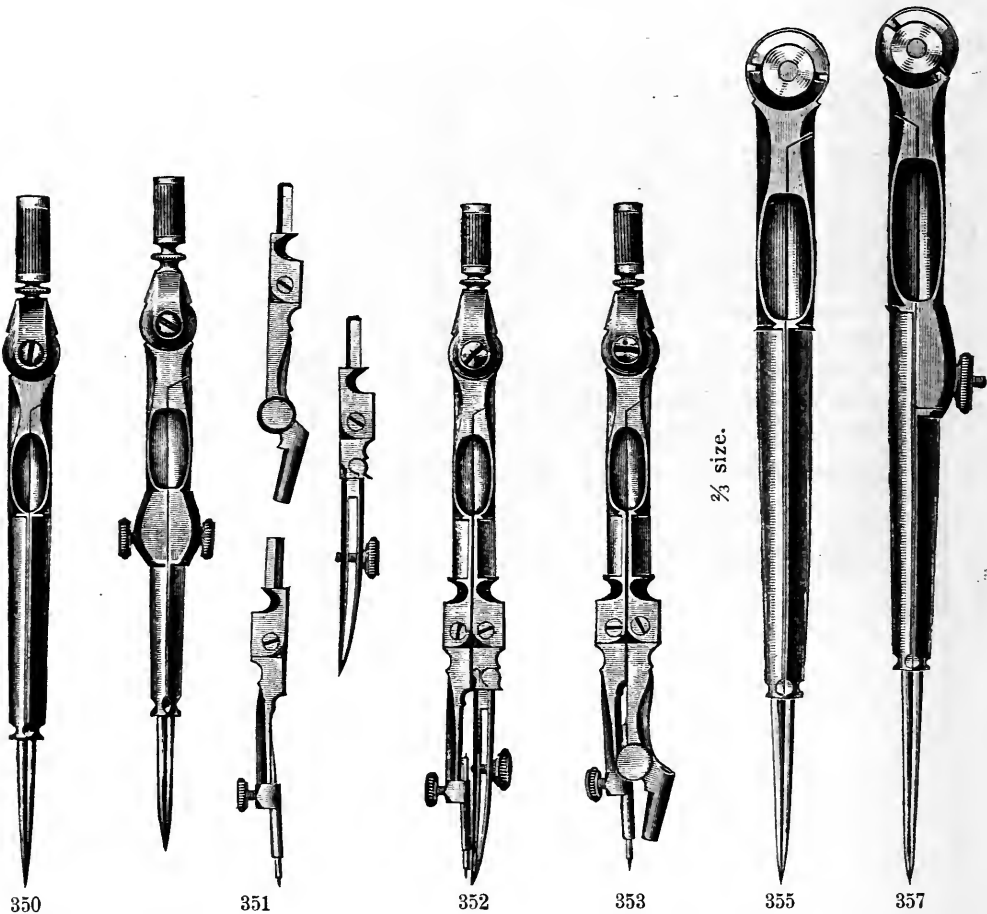
Tubular beam compass, 18 inch, 2 bars, pen, pencil, needle point and steel points, No. 195.

Horn center and German silver lead box.....\$61 20

Cases also fitted to order, at short notice, with such instruments as may be selected.

FINEST GERMAN INSTRUMENTS.

Of Best German Silver, Steel Points and Highest Finish.



No.		Each.
350.	Dividers with handle, 4 inch.....	\$0 90
351.	Compass, $3\frac{1}{2}$ inch, with pen, pencil and needle points.....	2 50
352.	" $3\frac{1}{2}$ " " fixed needle and pen points.....	1 90
353.	" $3\frac{1}{2}$ " " " " and pencil points.....	1 90
354.	Dividers, 4 inch	70
355.	" 5 "	80
356.	" 6 "	90
357.	Hairspring Dividers, 5 inch.....	1 25
358.	" " 6 "	1 75

FINEST GERMAN INSTRUMENTS.

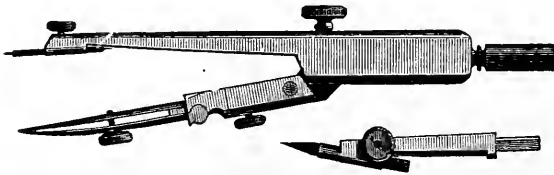
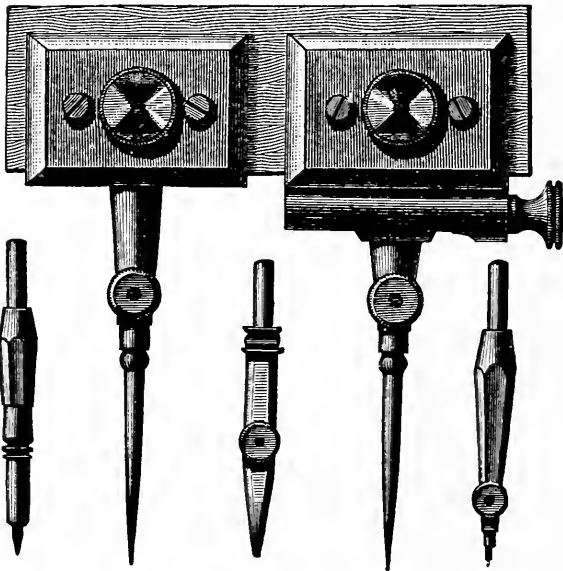
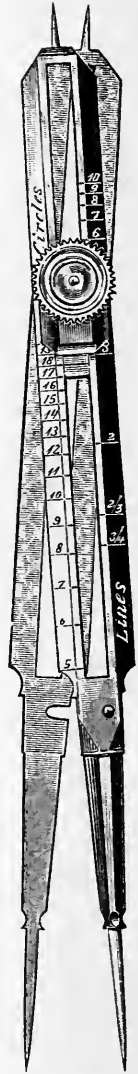


No.		Each.
359.	Compass, $5\frac{1}{2}$ inch, with pen, pencil points, and lengthening bar.....	\$2 25
360.	Compass, $5\frac{1}{2}$ inch, with pen, pencil, needle points and lengthening bar.....	3 25
361.	Same as No. 360, with joints in each leg.....	4 00
362.	Pocket Dividers, with sheath, 5 inch.....	1 50
363.	Pocket Compass, with folding points	5 20
364.	Triangular Compass, 5 inch, for taking off three points...	2 70

FINEST GERMAN INSTRUMENTS.



365

368 $\frac{2}{3}$ size.370 $\frac{1}{3}$ size.

366

No.		Each.
365.	Whole and Half Dividers, $6\frac{1}{2}$ inch.....	\$2 50
366.	Proportional Dividers, $7\frac{1}{4}$ in., for lines and circles, in case	6 50
367.	" " $9\frac{1}{4}$ in., " " " "	9 50
368.	Bow Pen, with spring, adjusting screw and pencil point....	1 90
369.	" " " " " "	1 35
370.	Beam Compass, to fit on any straight edge, with pen, pencil and needle points	6 25
	Morocco case for No. 370.....	75

FINEST GERMAN INSTRUMENTS.



377



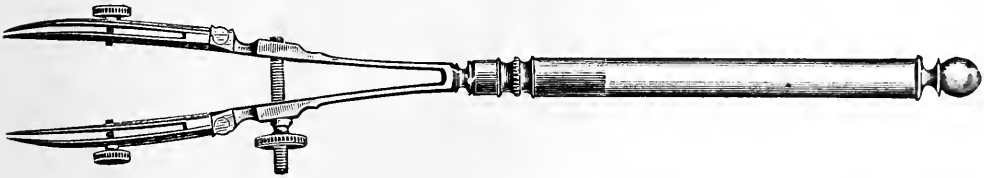
375



376



377A



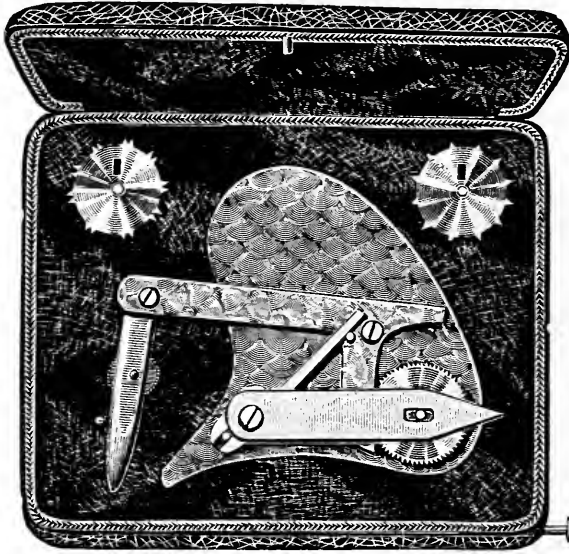
385

No.		Each.
371.	Drawing Pen, 4 inch.....	\$0 35
372.	" " 5 "	40
373.	" " 5 " common joint.....	45
374.	" " 4 " fine joint	45
375.	" " 5½ inch, fine joint.....	50
376.	" " 4 " " and pin	55
377.	" " 5½ " " "	60
377A.	Swedish Style Drawing Pen, 5 inch	60
377B.	" " " " 6 "	75
378.	Hatching Pen, 5 inch, with 3 pens to one handle.....	1 35
379.	" " 6 in., with pushing screw.....	70
380.	" " 6 " " " 2 pens to 1 handle	1 10
381.	" " 6 " " " 3 " 1 "	1 35
382.	Drawing Pen, 5 inch, with German silver blades, for red ink	65
383.	" " 5 " " " " "	85
	with joint.....	
384.	Drawing Pen, 5 inch, with German silver blades, for red ink, with joint and pin	1 00
385.	Railroad Pen, 5½ inch	2 25
386.	Dotting Pen, with 1 wheel, 5 inch	95

Drawing Pens carefully set and sharpened, each 20c. to 25c.



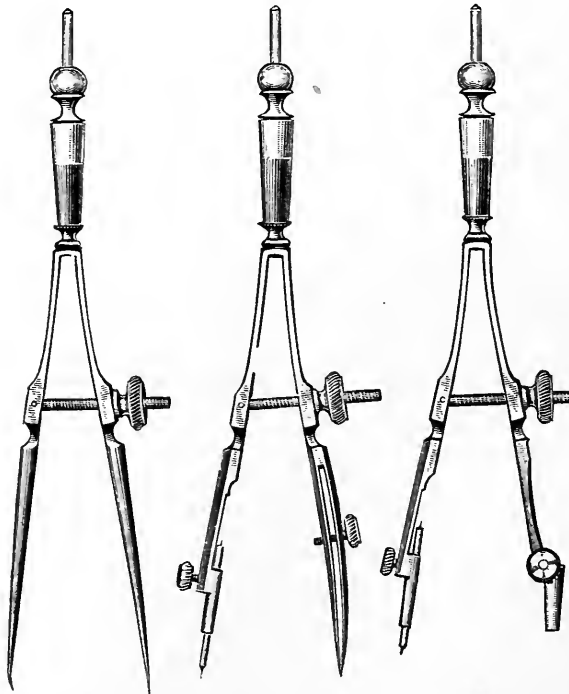
FINEST GERMAN INSTRUMENTS.



387

Each.

No. 387. Dotting Instrument, with 3 wheels, in case.....\$3 25



388

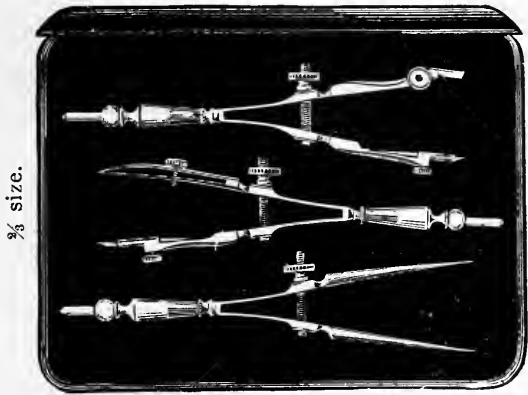
389

390

388.	Steel Spring Bow Dividers,	with white handle,	$3\frac{1}{2}$ inch...	75
389.	"	" Pen,	" " " and needle point,	
			$3\frac{1}{2}$ inch.....	1 05
390.	"	" Pencil,	with white handle and needle point,	
			$3\frac{1}{2}$ inch.....	1 05



FINEST GERMAN INSTRUMENTS.



388, 389, 390, in case.

No.

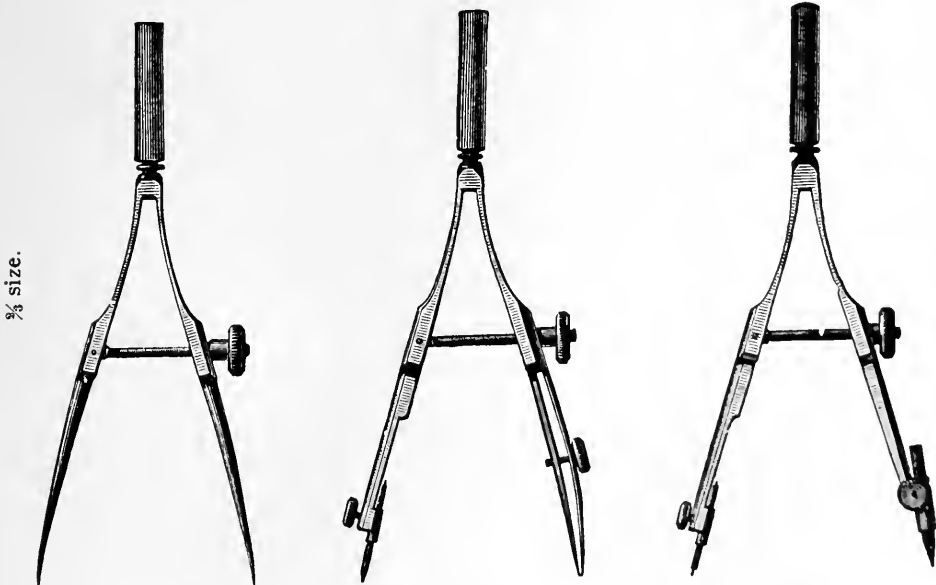
Each.

Steel Spring Bow Dividers, $3\frac{1}{2}$ inch, No. 388.

Steel Spring Bow Pen, $3\frac{1}{2}$ inch, No. 389.

Steel Spring Bow Pencil, $3\frac{1}{2}$ inch, No. 390.

In case..... \$3 60



391

392

393

- | | | | |
|-------------|-----------------------------------|--|------|
| 391. | Steel Spring Bow Dividers, | with German silver handle, $3\frac{1}{2}$ inch..... | 75 |
| 392. | “ “ Pen, | with needle point, German silver handle, $3\frac{1}{2}$ inch | 1 05 |
| 393. | “ “ Pencil, | with needle point, German silver handle, $3\frac{1}{2}$ inch | 1 05 |

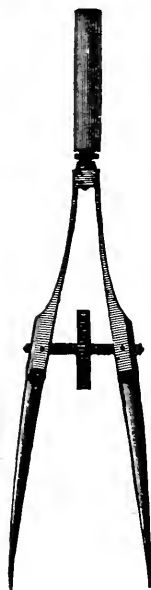
Steel Spring Bow Dividers, $3\frac{1}{2}$ inch, No. 391.

Steel Spring Bow Pen, $3\frac{1}{2}$ inch, No. 392.

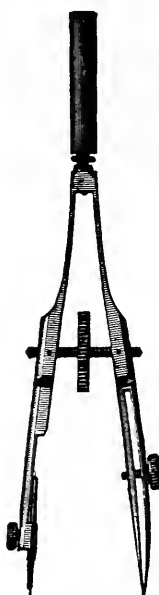
Steel Spring Bow Pencil, $3\frac{1}{2}$ inch, No. 393.

In case..... 3 60

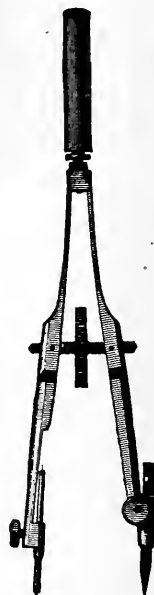
FINEST GERMAN INSTRUMENTS.



391A



392A



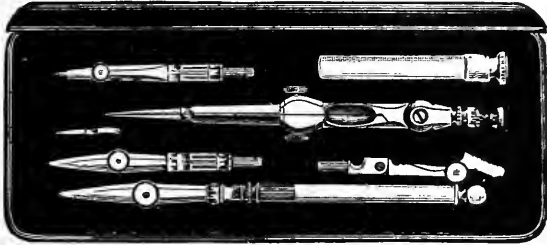
393A

No.		Each.
391A.	Steel Spring Bow Dividers, $3\frac{1}{2}$ inch, German silver handle	\$1 40
392A.	Steel Spring Bow Pen, $3\frac{1}{2}$ inch, with needle point, German silver handle.....	1 60
393A.	Steel Spring Bow Pencil, $3\frac{1}{2}$ inch, with needle point, German silver handle.....	1 60
393B.	Steel Spring Bow Dividers, $3\frac{1}{2}$ inch, No. 391A. Steel Spring Bow Pen, $3\frac{1}{2}$ inch, No. 392A. Steel Spring Bow Pencil, $3\frac{1}{2}$ inch, No. 393A. In case.....	5 35

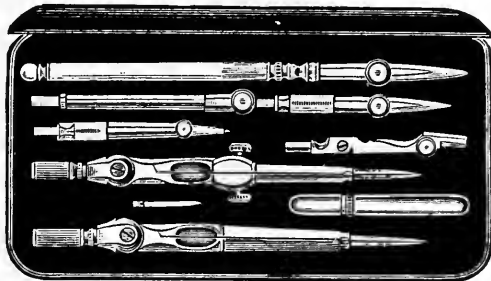
Steel Spring Bows No. 391A, 392A, 393A, 393B, have a right and left thread, operated by one thumb nut situated between the shanks of the instrument. They are opened and closed by the screw, which holds the points rigidly in any position.

FINEST GERMAN INSTRUMENTS.

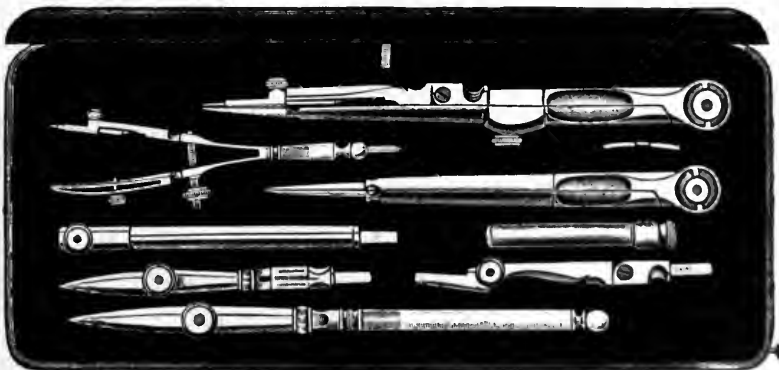
In Fine Morocco Cases, Velvet Lined. German Silver, with Steel Points and Joints, Highly Finished.



- | | | |
|-------------|---|--------|
| No. | 400 | Each. |
| 400. | Pocket Case , containing compass, $3\frac{1}{2}$ inch, with pen, pencil and needle point, No. 351. | |
| | Drawing pen, with joint and pin, No. 376..... | \$4 25 |



- | | | |
|-------------|---|------|
| | 401 | |
| 401. | Pocket Case , containing compass, $3\frac{1}{2}$ inch, with pen, pencil, needle point and lengthening bar, like No. 351. | |
| | Plain dividers, $3\frac{1}{2}$ inch, No. 350. | |
| | Drawing pen, with joint and pin, No. 376 | 5 00 |

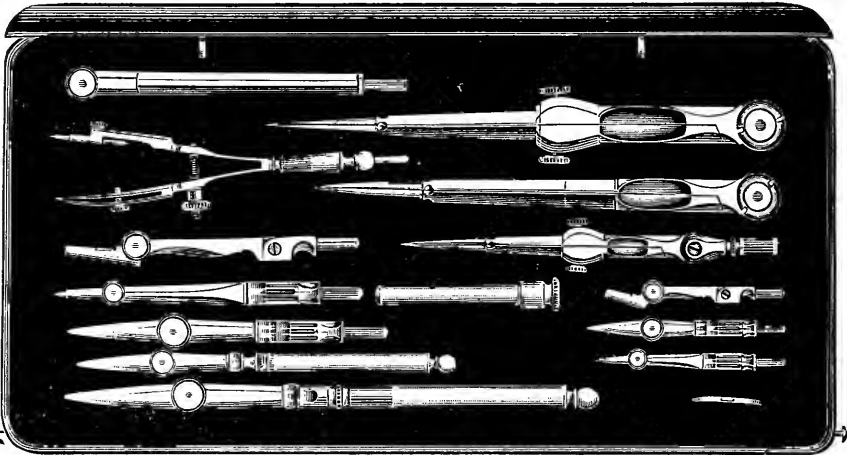


- | | | |
|-------------|--|------|
| | 402 | |
| 402. | Pocket Case , containing compass, $4\frac{1}{2}$ inch, with fixed needle point, pen, pencil points and lengthening bar. | |
| | Plain dividers, $4\frac{1}{2}$ inch. | |
| | Steel spring bow pen, with needle point, No. 389. | |
| | Drawing pen, $5\frac{1}{2}$ inch, with joint and pin, No. 377..... | 7 30 |

FINEST GERMAN INSTRUMENTS.

In Fine Morocco Pocket Cases, Velvet Lined.

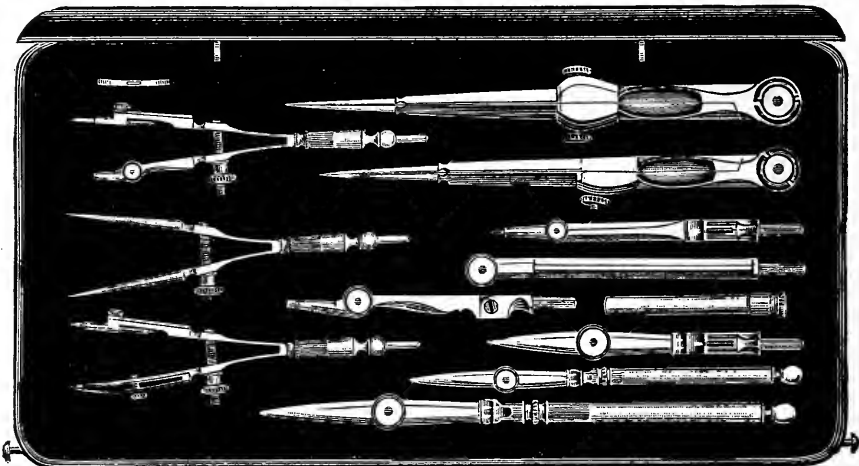
- | No. | | Each. |
|-------------|--|--------|
| 404. | Pocket Case , containing compass, $5\frac{1}{2}$ inch, with pen, pencil, needle point and lengthening bar, No. 360.
Plain dividers, 5 inch, No. 355.
Drawing pen, $5\frac{1}{2}$ inch, joint, pin and ivory handle, No. 377.. | \$6 65 |
| 405. | Pocket Case , containing compass, $5\frac{1}{2}$ inch, with pen, pencil, needle point and lengthening bar, No. 360.
Compass, $3\frac{1}{2}$ inch, with pen, pencil and needle point, No. 351.
Plain dividers, 5 inch, No. 355.
Drawing pen, 4 inch, joint, pin and ivory handle, No. 376.
Drawing pen, $5\frac{1}{2}$ inch, joint, pin and ivory handle, No. 377 .. | 9 90 |



406

- 406. Pocket Case**, containing compass, $5\frac{1}{2}$ inch, with pen, pencil, needle point and lengthening bar, No. 360.
Compass, $3\frac{1}{2}$ inch, with pen, pencil and needlepoint, No. 351.
Plain dividers, 5 inch, No. 355.
Drawing pen, 4 inch, with joint, pin and ivory handle, No. 376.
Drawing pen, $5\frac{1}{2}$ in., with joint, pin and ivory handle, No. 377.
Steel spring bow pen, $3\frac{1}{2}$ inch, ivory handle, No. 389.....

11 50



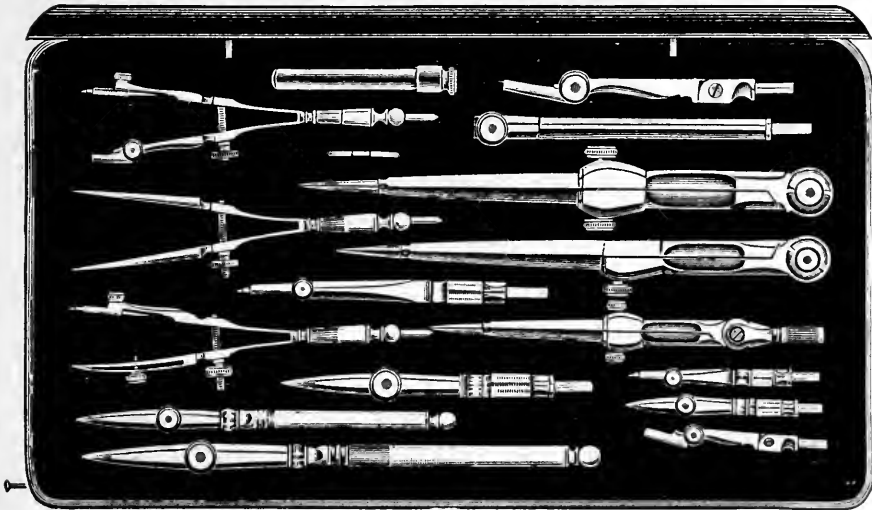
407



FINEST GERMAN INSTRUMENTS.

In Fine Morocco Pocket Cases, Velvet Lined.

- | No. | | Each. |
|-------------|--|---------|
| 407. | Pocket Case , containing compass, $5\frac{1}{2}$ inch, with pen, pencil, needle point and lengthening bar, No. 360.
Hairspring dividers, 5 inch, No. 357.
Drawing pen, 4 inch, joint, pin and ivory handle, No. 376.
Drawing pen, $5\frac{1}{2}$ inch, with joint, pin and ivory handle, No. 377.
Steel spring bow dividers, $3\frac{1}{2}$ inch, ivory handle, No. 388.
Steel spring bow pen, $3\frac{1}{2}$ inch, ivory handle, No. 389.
Steel spring bow pencil, $3\frac{1}{2}$ inch, ivory handle, No. 390..... | \$12 00 |



408

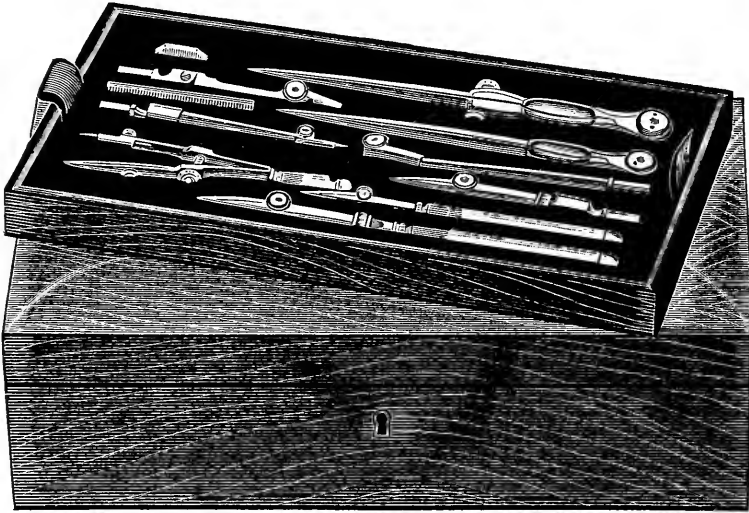
- | | | |
|-------------|--|-------|
| 408. | Pocket Case , containing compass, $5\frac{1}{2}$ inch, with pen, pencil, needle point and lengthening bar, No. 360.
Compass, $3\frac{1}{2}$ inch, with pen, pencil and needle point, No. 351.
Hairspring dividers, 5 inch, No. 357.
Drawing pen, 4 inch, joint, pin and ivory handle, No. 376.
Drawing pen, $5\frac{1}{2}$ inch, joint, pin and ivory handle, No. 377.
Steel spring bow dividers, $3\frac{1}{2}$ inch, ivory handle, No. 388.
Steel spring bow pen, $3\frac{1}{2}$ inch, ivory handle, No. 389.
Steel spring bow pencil, $3\frac{1}{2}$ inch, ivory handle, No. 390..... | 14 75 |
|-------------|--|-------|

Morocco pocket cases, containing special assortments of fine German instruments, made to order.



FINEST GERMAN INSTRUMENTS.

In Fine Polished Black Walnut Cases, with Lock and Tray.
Trays Velvet Lined.



410

No. **410.** Polished Black Walnut Case, containing compass, $5\frac{1}{2}$ inch, with pen, pencil, needle point and lengthening bar, No. 360. Each.

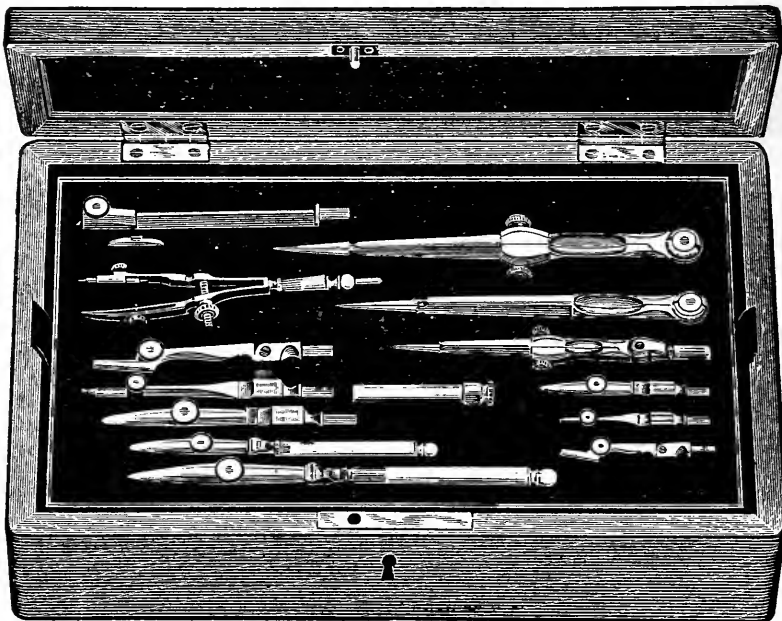
Plain dividers, 5 inch, No. 355.

Drawing pen, $5\frac{1}{2}$ inch, joint, pin and ivory handle, No. 377.

Steel spring bow pen, $3\frac{1}{2}$ inch, ivory handle, No. 389.

German silver protractor.

Ivory plotting scale and rubber triangle \$10 75



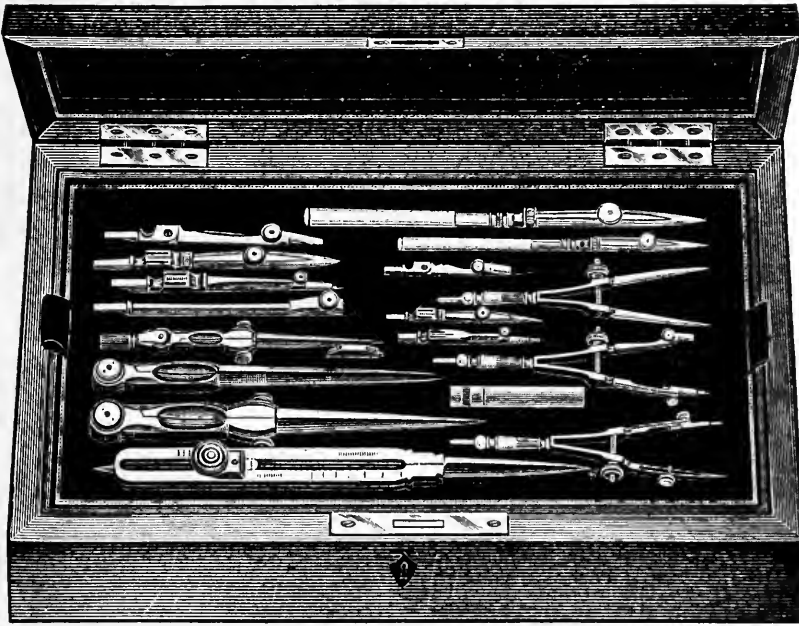
412



FINEST GERMAN INSTRUMENTS.

In Fine Polished Black Walnut Cases, with Lock and Tray.
Trays Velvet Lined.

- | No. | Each. |
|---|---------|
| 412. Polished Black Walnut Case, containing compass, $5\frac{1}{2}$ inch, with pen, pencil, needle point and lengthening bar, No. 360. | |
| Compass, $3\frac{1}{2}$ inch, pen, pencil and needle point, No. 351. | |
| Plain dividers, 5 inch, No. 355. | |
| Drawing pen, 4 inch, joint, pin and ivory handle, No. 376. | |
| Drawing pen, $5\frac{1}{2}$ inch, joint, pin and ivory handle, No. 377. | |
| Steel spring bow pen, $3\frac{1}{2}$ inch, ivory handle, No. 389. | |
| German silver protractor. | |
| Ivory plotting scale and rubber triangle | \$14 40 |



413

- | | |
|---|-------|
| 413. Polished Black Walnut Case, containing compass, $5\frac{1}{2}$ inch, with pen, pencil, needle point and lengthening bar, No. 360. | |
| Compass $3\frac{1}{2}$ inch, with pen, pencil and needle point, No. 351. | |
| Proportional divider, $7\frac{1}{4}$ inch, No. 366. | |
| Hairspring dividers, 5 inch, No. 357. | |
| Drawing pen, 4 inch, joint, pin and ivory handle, No. 376. | |
| Drawing pen, $5\frac{1}{2}$ inch, joint, pin and ivory handle, No. 377. | |
| Steel spring bow dividers, $3\frac{1}{2}$ inch, ivory handle, No. 388. | |
| Steel spring bow pen, $3\frac{1}{2}$ inch, ivory handle, No. 389. | |
| Steel spring bow pencil, $3\frac{1}{2}$ inch, ivory handle, No. 390. | |
| German silver protractor. | |
| Ivory plotting scale and rubber triangle | 24 25 |



FINEST GERMAN INSTRUMENTS.

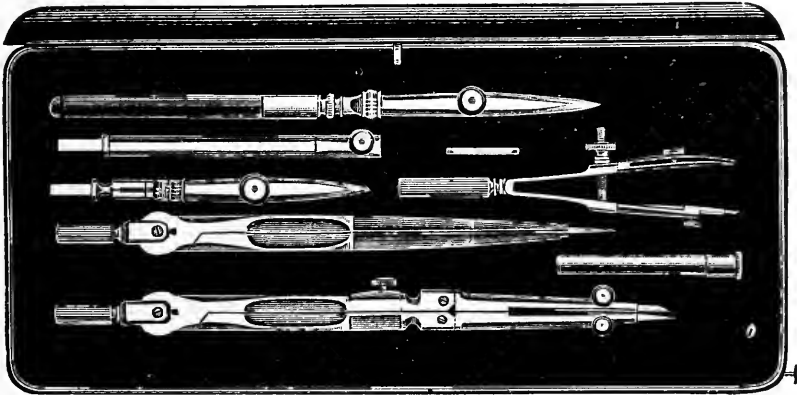
In Fine Polished Black Walnut Cases, with Lock and Tray.
Trays Velvet Lined.

- | No. | Each. |
|---|---------|
| 414. Polished Black Walnut Case, containing compass, $5\frac{1}{2}$ inch, with pen, pencil, needle point and lengthening bar, No. 360. | |
| Compass, $3\frac{1}{2}$ inch, with pen, pencil and needle point, No. 351. | |
| Plain dividers, 5 inch, No. 355. | |
| Hairspring dividers, 5 inch, No. 357. | |
| Drawing pen, 4 inch, joint, pin and ivory handle, No. 376. | |
| Drawing pen, $5\frac{1}{2}$ inch, joint, pin and ivory handle, No. 377. | |
| Proportional dividers, $7\frac{1}{4}$ inch, No. 366. | |
| Railroad pen, $5\frac{1}{2}$ inch, No. 385. | |
| Steel spring bow dividers, $3\frac{1}{2}$ inch, ivory handle, No. 388. | |
| Steel spring bow pen, $3\frac{1}{2}$ inch, ivory handle, No. 389. | |
| Steel spring bow pencil, $3\frac{1}{2}$ inch, ivory handle, No. 390. | |
| German silver protractor. | |
| Ivory plotting scale and rubber triangle | \$31 00 |
| 415. Polished Black Walnut Case, containing compass, $5\frac{1}{2}$ inch, with pen, pencil, needle point and lengthening bar, No. 360. | |
| Compass, $3\frac{1}{2}$ inch, with pen, pencil and needle point, No. 351. | |
| Plain dividers, 5 inch, No. 355. | |
| Hairspring dividers, 5 inch, No. 357. | |
| Drawing pen, 4 inch, joint, pin and ivory handle, No. 376. | |
| Drawing pen, $5\frac{1}{2}$ inch, joint, pin and ivory handle, No. 377. | |
| Proportional dividers, $7\frac{1}{4}$ inch, No. 366. | |
| Railroad pen, $5\frac{1}{2}$ inch, No. 385. | |
| Steel spring bow dividers, $3\frac{1}{2}$ inch, ivory handle, No. 388. | |
| Steel spring bow pen, $3\frac{1}{2}$ inch, ivory handle, No. 389. | |
| Steel spring bow pencil, $3\frac{1}{2}$ inch, ivory handle, No. 390. | |
| Beam compass, pen, pencil, needle point and 2 steel points, No. 370. | |
| German silver protractor. | |
| Ivory plotting scale and rubber triangle | 37 40 |



FINEST GERMAN INSTRUMENTS.

In Fine Morocco Pocket Cases, Velvet Lined. Compasses and Dividers with Pivot Joint Handle.



420

Each.

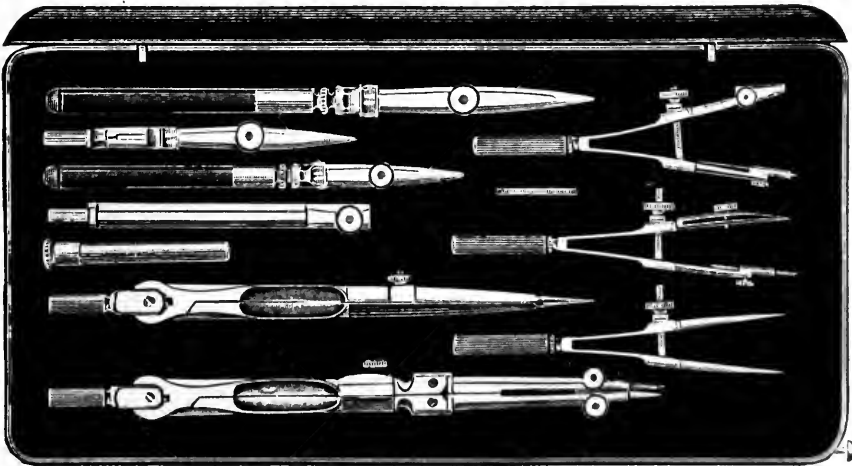
No. **420. Pocket Case**, containing compass, $5\frac{1}{2}$ inch, with pen, pencil, fixed needle point and lengthening bar.

Plain dividers, $5\frac{1}{2}$ inch.

Steel spring bow pen, $3\frac{1}{2}$ inch, German silver handle.

Drawing pen, $5\frac{1}{2}$ inch, joint, pin and black handle.

German silver lead box \$6 00



421

421. Pocket Case, containing compass, $5\frac{1}{2}$ inch, with pen, pencil, fixed needle point and lengthening bar.

Hairspring dividers, 5 inch.

Steel spring bow dividers, $3\frac{1}{2}$ inch, German silver handle.

Steel spring bow pen, $3\frac{1}{2}$ inch, German silver handle.

Steel spring bow pencil, $3\frac{1}{2}$ inch, German silver handle.

Drawing pen, 5 inch, joint, pin and black handle.

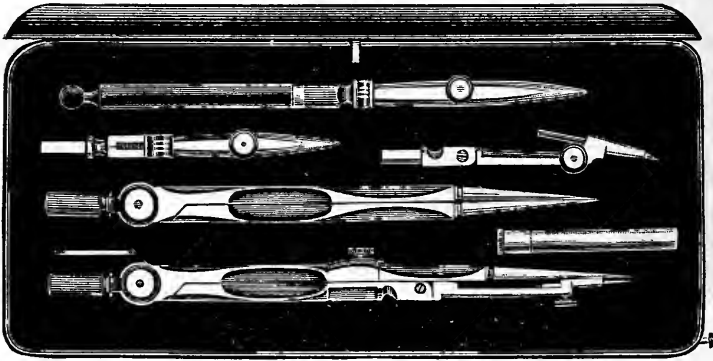
Drawing pen, 4 inch, joint, pin and black handle.

German silver lead box 8 50



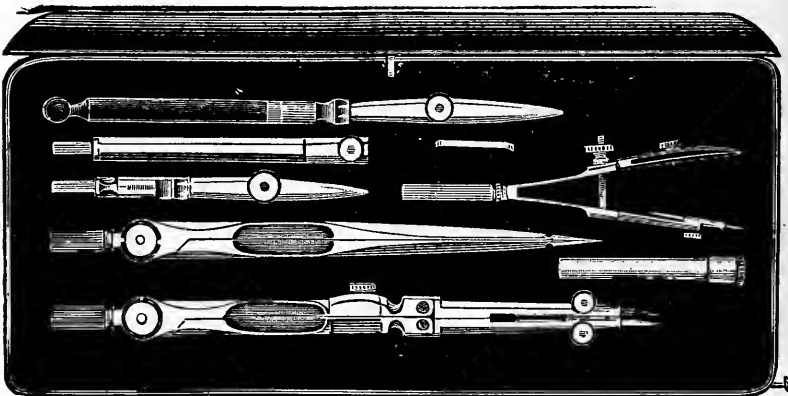
GERMAN INSTRUMENTS.

In Morocco Pocket Cases, Velvet Lined. Compasses and Dividers with Handle.



435

- | | | |
|-------------|---|--------|
| No. | | Each. |
| 425. | Pocket Case , containing compass, $5\frac{1}{2}$ inch, with handle, pen, pencil and fixed needle point.
Plain dividers, $5\frac{1}{2}$ inch, with handle, round steel points.
Drawing pen, $5\frac{1}{2}$ inch, joint and black handle.
German silver lead box..... | \$2 50 |



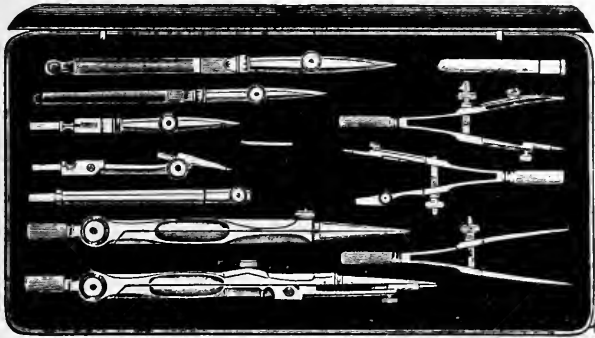
426

- | | | |
|-------------|--|------|
| 426. | Pocket Case , containing compass, $5\frac{1}{2}$ inch, with handle, pen, pencil, fixed needle point and lengthening bar.
Plain dividers, $5\frac{1}{2}$ inch, with handle, round steel points.
Steel spring bow pen, $3\frac{1}{2}$ inch, German silver handle.
Drawing pen, $5\frac{1}{2}$ inch, joint and black handle.
German silver lead box..... | 3 50 |
|-------------|--|------|



GERMAN INSTRUMENTS.

In Morocco Pocket Cases, Velvet Lined. Compasses and Dividers with Handles.



No.

427

Each.

427. Pocket Case, containing compass, $5\frac{1}{2}$ inch, with handle, pen, pencil, fixed needle point and lengthening bar.

Hairspring dividers, $5\frac{1}{2}$ inch, with handle, round points.

Steel spring bow dividers, $3\frac{1}{2}$ inch, German silver handle.

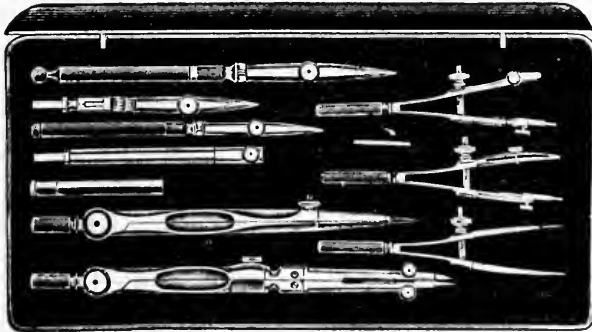
Steel spring bow pen, $3\frac{1}{2}$ inch, German silver handle.

Steel spring bow pencil, $3\frac{1}{2}$ inch, German silver handle.

Drawing pen, $5\frac{1}{2}$ inch, joint and black handle.

Drawing pen, $4\frac{1}{2}$ inch, joint and black handle.

German silver lead box..... \$6 00



428

428. Pocket Case, containing compass, $5\frac{1}{2}$ inch, with handle, joint in each leg, pen, pencil, fixed needle point and lengthening bar.

Hairspring dividers, $5\frac{1}{2}$ inch, with handle, round points.

Steel spring bow dividers, $3\frac{1}{2}$ inch, German silver handle.

Steel spring bow pen, $3\frac{1}{2}$ inch, German silver handle.

Steel spring bow pencil, $3\frac{1}{2}$ inch, German silver handle.

Drawing pen, $5\frac{1}{2}$ inch, joint and black handle.

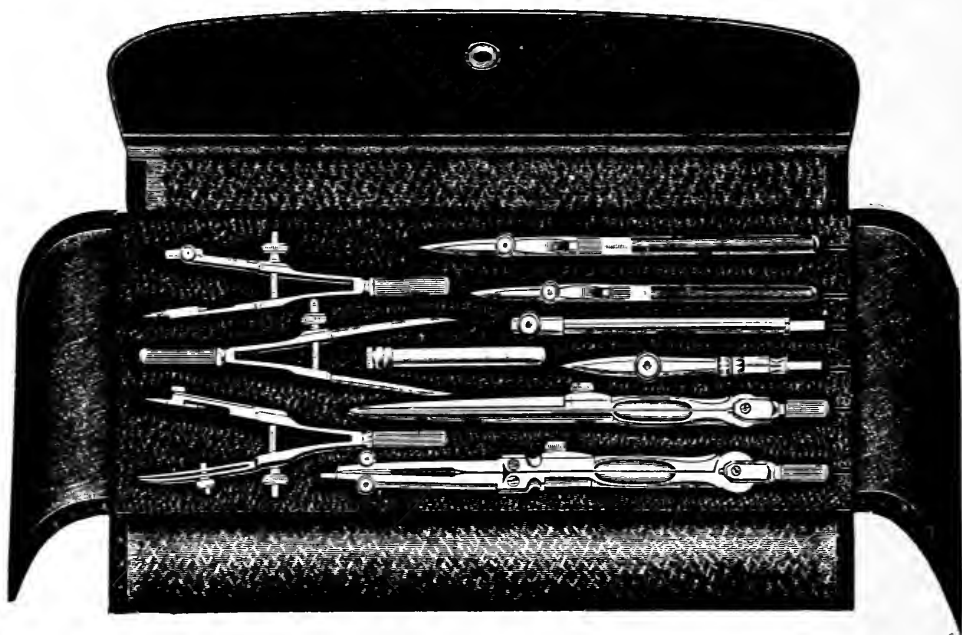
Drawing pen, $4\frac{1}{2}$ inch, joint and black handle.

German silver lead box..... 7 50



EMPTY POCKET CASES.

Velvet Lined. Fitted for Mathematical Instruments.



No.

429

429. Folding Pocket Case No 429 is made of morocco leather, lined with chamois skin. This style of case is certainly the most compact and convenient pocket case made. For assortments of instruments like those contained in our sets Nos. 264 to 267, Folding Pocket Case No. 429 is best adapted. The size of this folding pocket case required to hold any of these assortments is a trifle smaller than the regular morocco cases in which these instruments are illustrated in our catalogue. Prices of Folding Pocket Case No. 429 are the same as those of regular empty pocket cases, lined with silk velvet and listed below.

MOROCCO POCKET CASES.

Lined with Cotton Velvet.

Size of Case.	Each.
2 x 6 inch	\$1 30
3 x 7½ "	1 75
3½ x 9 "	2 00
5 x 9 "	2 40
6 x 10 "	3 20
7 x 11 "	3 70
7 x 13 "	4 20
5 x 12½ "	3 70

Lined with Silk Velvet.

Size of Case.	Each.
2 x 6 inch	\$1 50
3 x 7 $\frac{1}{2}$ "	2 00
3 $\frac{1}{2}$ x 9 "	2 50
5 x 9 "	3 00
6 x 10 "	4 00
7 x 11 "	4 50
7 x 13 "	5 00
5 x 12 $\frac{1}{2}$ "	4 50

Wooden cases, with lock and tray, of polished rosewood, mahogany or black walnut,
made to order.

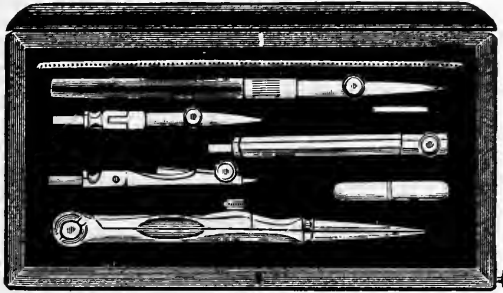
PARTS OF INSTRUMENTS.

	Swiss.	German.
Pen, pencil or needle point, for $3\frac{1}{2}$ inch compasses..... each,	\$1 20	\$0 90
" " " " " 6 " "	1 50	1 00
Nuts and screws.....	15	12
Needles, shouldered.....	15	08
Handles for drawing pens.....	25	20



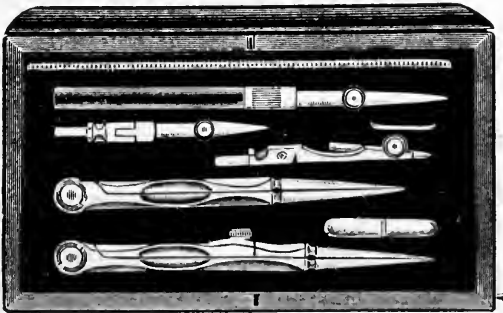
NICKEL PLATED INSTRUMENTS FOR SCHOOLS.

In Leatherette Covered Pocket Cases.



430

- | | | |
|-------------|---|--------|
| No. | | Each. |
| 430. | Pocket Case , containing compass, $4\frac{1}{2}$ inch, with pen, pencil point and lengthening bar.
Drawing pen, 5 inch, black handle.
Rule, protractor and box of leads..... | \$0 75 |



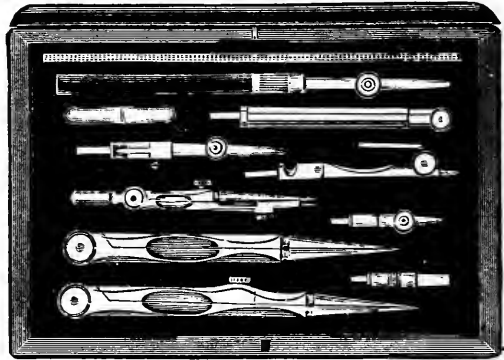
431

- | | | |
|-------------|--|------|
| 431. | Pocket Case , containing compass, $4\frac{1}{2}$ inch, with pen and pencil points.
Plain dividers, $4\frac{1}{4}$ inch.
Drawing pen, 5 inch, black handle.
Rule, protractor and box of leads..... | 1 00 |
| 432. | Pocket Case , containing compass, $4\frac{1}{2}$ inch, with pen, pencil and lengthening bar.
Plain dividers, $4\frac{1}{4}$ inch.
Drawing pen, 5 inch, black handle.
Rule, protractor and box of leads | 1 15 |



NICKEL PLATED INSTRUMENTS FOR SCHOOLS.

In Leatherette Covered Pocket Cases.

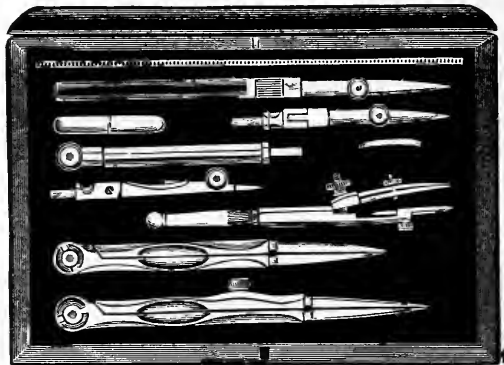


No.

433

Each.

- 433. Pocket Case**, containing compass, $4\frac{1}{2}$ inch, with pen, pencil and lengthening bar.
 Plain dividers, $4\frac{1}{4}$ inch.
 Compass, 3 inch, with handle, pen and pencil points.
 Drawing pen, 5 inch, black handle.
 Rule, protractor and box of leads \$1 50



434

- 434. Pocket Case**, containing compass, $4\frac{1}{2}$ inch, with pen, pencil and lengthening bar.
 Plain dividers, $4\frac{1}{4}$ inch.
 Spring bow pen, $3\frac{3}{4}$ inch.
 Drawing pen, 5 inch, black handle.
 Rule, protractor and box of leads 1 75



FRENCH INSTRUMENTS,

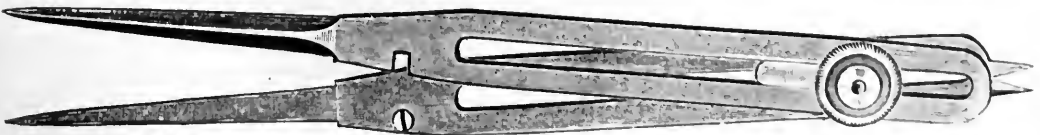
Of Brass and German Silver.

These instruments we especially recommend to beginners and apprentices, on account of their great cheapness.



461

No		.Each.
460.	Plain Dividers, brass, $4\frac{1}{4}$ inch.....	\$0 20
461.	" " " $5\frac{1}{2}$ "	22
462.	" " " $6\frac{1}{4}$ "	25
463.	" " German silver, $5\frac{1}{2}$ inch	50
464.	Compass, brass, $4\frac{1}{4}$ inch, with pencil point.....	35
465.	" " $5\frac{1}{2}$ " " "	45
466.	" " $6\frac{1}{4}$ " " "	55
467.	" " $4\frac{1}{4}$ " " pen, pencil point and length- ening bar.....	50
468.	" brass, $5\frac{1}{2}$ inch, with pen, pencil point and length- ening bar.....	60
469.	" brass, $6\frac{1}{4}$ inch, with pen, pencil point and length- ening bar.....	65
470.	" brass, $5\frac{1}{2}$ inch, with fixed needle point, pen, pencil points and lengthening bar, 1 key.....	70
471.	" German silver, $5\frac{1}{2}$ inch, the same as No. 468.....	1 10
472.	" " $5\frac{1}{2}$ " " " " " 470.....	1 30



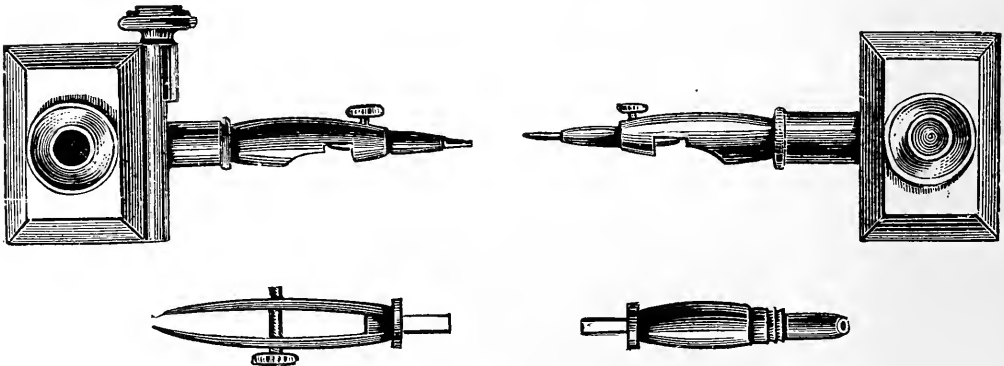
473

473.	Proportional Dividers, brass, $6\frac{1}{4}$ inch, in case.....	1 75
474.	" " " 8 " "	4 25



FRENCH INSTRUMENTS.

No.		Each.
475.	Proportional Dividers , German silver, $6\frac{1}{4}$ inch, in case....	\$2 20
476.	“ “ “ “ $6\frac{1}{2}$ “ divided for lines, circles, solids and planes, in case.....	4 30
477.	Proportional Dividers , German silver, 7 inch, with rack movement, in case.....	5 50
478.	Proportional Dividers , German silver, 7 inch, with rack movement, divided for lines, circles, solids and planes, in case.....	6 50
479.	Proportional Dividers , German silver, 7 inch, with rack movement, points bent rectangular, for lines and circles, in case.....	6 75



480

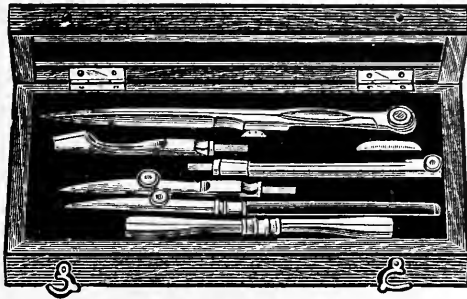
480.	Beam Compass , German silver, with pen and pencil points, in case.....	5 40
481.	Same as 480, brass.....	5 00



482

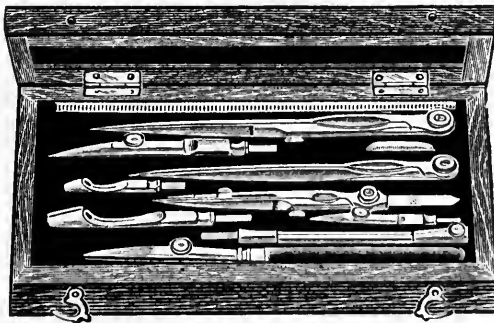
482.	Drawing Pen , ebony handle.....	15
483.	“ “ white bone handle, with pin.....	20

FRENCH INSTRUMENTS, Of Brass and German Silver, in Cases.



487

- | No. | Description | Each. |
|------|--|--------|
| 485. | Mahogany Case , containing 5 pieces, brass, compass, $4\frac{1}{2}$ inch, with pen and pencil points, key..... | \$0 45 |
| 486. | Mahogany Case , containing 8 pieces, brass, compass, $4\frac{1}{4}$ inch, with pen, pencil points and lengthening bar, crayon holder, protractor, key, rule | 60 |
| 487. | Mahogany Case , containing 9 pieces, brass, compass, $4\frac{1}{4}$ inch, with pen, pencil points and lengthening bar, drawing pen, crayon holder, protractor, key, rule..... | 75 |
| 488. | Mahogany Case , containing 10 pieces, brass, compass, $4\frac{1}{4}$ inch, with pen, pencil points and lengthening bar, dividers, $3\frac{1}{2}$ inch, drawing pen, protractor, crayon holder, key, rule, | 80 |



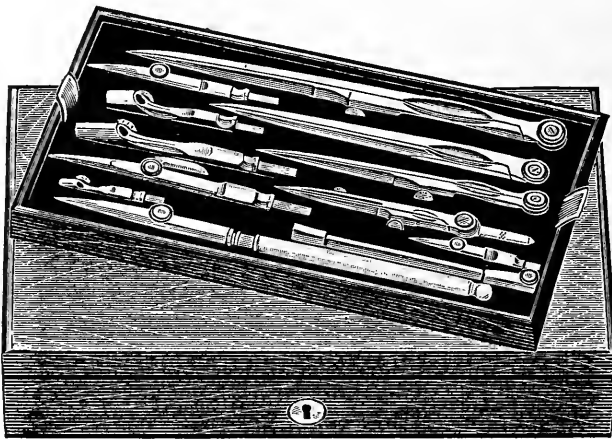
489

- | | | |
|------|--|------|
| 489. | Mahogany Case , containing 12 pieces, brass.
Compass, $4\frac{1}{2}$ inch, pen, pencil points and lengthening bar.
Dividers, $3\frac{1}{2}$ inch.
Bow pen with pencil point.
Drawing pen, protractor, key, rule | 1 15 |
| 490. | Mahogany Case , containing 12 pieces, brass.
Compass, $5\frac{1}{2}$ inch, pen, pencil points and lengthening bar.
Dividers, $4\frac{1}{4}$ inch.
Bow pen with pencil point.
Drawing pen, protractor, key and rule..... | 1 45 |



FRENCH INSTRUMENTS.

- | No. | | Each. |
|--------------|---|--------|
| 490A. | Rosewood Case , with lock and tray, containing 12 pieces,
brass.
Compass, $5\frac{1}{2}$ inch, pen, pencil points and lengthening bar.
Dividers, $4\frac{1}{4}$ inch.
Bow pen with pencil point,
Drawing pen, protractor, key and rule..... | \$1 90 |
| 491. | Rosewood Case , with lock and tray, containing 12 pieces,
German silver, the same as No. 490A | 3 80 |
| 492. | Rosewood Case , with lock and tray, containing 12 pieces,
brass.
Compass, $6\frac{1}{4}$ inch, pen, pencil points and lengthening bar.
Dividers, $5\frac{1}{2}$ inch.
Bow pen with pencil point.
Drawing pen, protractor, key and rule..... | 2 25 |



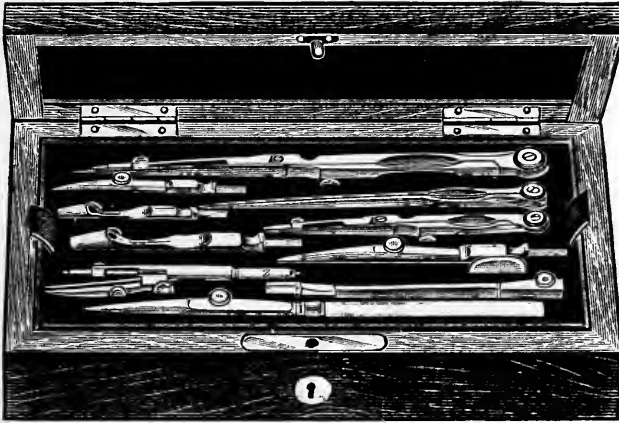
493

- | | | |
|-------------|--|------|
| 493. | Rosewood Case , with lock and tray, containing 16 pieces,
brass.
Compass, $6\frac{1}{4}$ inch, with pen, pencil points and lengthening
bar.
Compass, $3\frac{1}{2}$ inch, with pen and pencil points.
Dividers, $4\frac{1}{4}$ inch,
Bow pen with pencil point.
Drawing pen, 2 protractors, key and rule..... | 2 50 |
| 494. | Rosewood Case , with lock and tray, containing 16 pieces,
brass,
Compass, $6\frac{1}{4}$ inch, with pen, pencil, needle points and length-
ening bar.
Compass, $3\frac{1}{2}$ inch, with pen, pencil and needle points.
Dividers, $4\frac{1}{4}$ inch.
Bow pen with pencil points.
Drawing pen, 2 protractors, key and rule..... | 3 00 |



FRENCH INSTRUMENTS.

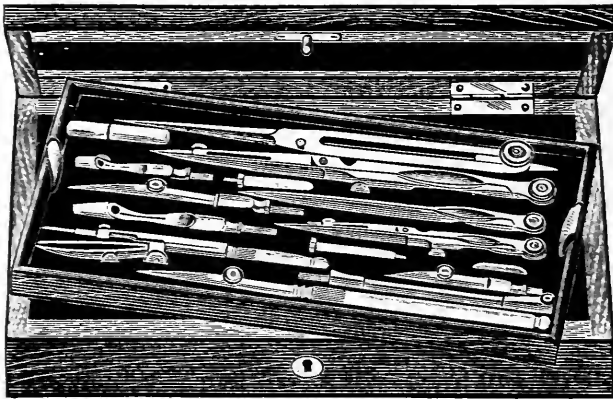
- | No. | | Each. |
|------|---|--------|
| 495. | Rosewood Case, with lock and tray, containing 16 pieces,
German silver, the same as No. 494..... | \$6 00 |



502

- | | | |
|------|---|------|
| 502. | Rosewood Case, with lock and tray, containing 14 pieces,
brass.
Compass, $6\frac{1}{4}$ inch, with pen, pencil, needle points and length-
ening bar.
Compass, $4\frac{1}{4}$ inch, pen, pencil and needle points.
Dividers, $4\frac{1}{4}$ inch.
Spring bow pen.
Drawing pen, 2 protractors, rule and key..... | 3 35 |
| 503. | Rosewood Case, with lock and tray, containing 14 pieces,
German silver.
Compass, $6\frac{1}{4}$ inch, with pen, pencil, needle points and length-
ening bar.
Compass, $4\frac{1}{4}$ inch, pen, pencil and needle points.
Dividers, $4\frac{1}{4}$ inch.
Spring bow pen.
Drawing pen, 2 protractors, rule and key..... | 5 50 |
| 504. | Rosewood Case, with lock and tray, containing 14 pieces,
brass.
Compass, $6\frac{1}{4}$ inch, with pen, pencil, needle points and length-
ening bar.
Compass, $4\frac{1}{4}$ inch, pen, pencil and needle points.
Dividers, $4\frac{1}{4}$ inch.
Spring bow pen.
Drawing pen, 2 protractors, rule and key | 3 80 |
- Compasses with patent pencil points.

FRENCH INSTRUMENTS.



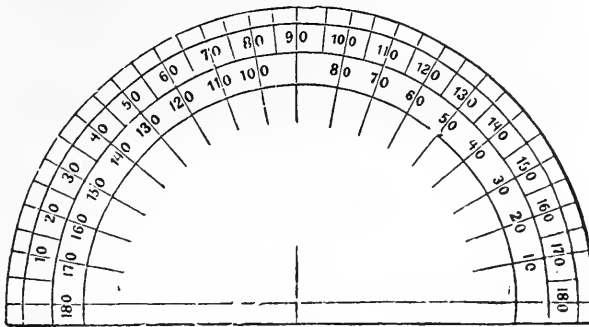
505

- | No. | | Each. |
|------|---|--------|
| 505. | <p>Rosewood Case, with lock and tray, containing 15 pieces, brass.</p> <p>Compass, $6\frac{1}{4}$ inch, with pen, pencil, needle points, and lengthening bar</p> <p>Compass, $4\frac{1}{2}$ inch, with pen, pencil and needle points.</p> <p>Dividers, $4\frac{1}{4}$ inch.</p> <p>Spring bow pen,</p> <p>Proportional dividers.</p> <p>Drawing pen, protractor, key, 2 patent pencil points.....</p> | \$5 40 |
| 506. | <p>Rosewood Case, with lock and tray, containing 15 pieces, German Silver.</p> <p>Compass, $6\frac{1}{2}$ inch, with pen, pencil, needle points and lengthening bar.</p> <p>Compass, $4\frac{1}{4}$ inch, with pen, pencil and needle points.</p> <p>Dividers, $4\frac{1}{4}$ inch.</p> <p>Spring bow pen.</p> <p>Proportional dividers.</p> <p>Drawing pen, protractor, key and 2 patent pencil points....</p> | 8 00 |

PROTRACTORS,

Of Paper, Horn, Boxwood, Ivory, Brass or German Silver.

No.		Each.
510.	Circular Protractor , on vegetable tracing paper, 14 inch diameter, $\frac{1}{4}^{\circ}$	\$0 30
511.	Circular Protractor , on drawing paper, 14 inch diameter, $\frac{1}{4}^{\circ}$	30
512.	" " on bristol board, 14 inch diameter, $\frac{1}{4}^{\circ}$	40
513.	" " " " 8 " " $\frac{1}{2}^{\circ}$	20
514.	Semi-circular Protractor , on bristol board, 5 inch diameter, $\frac{1}{2}^{\circ}$	10



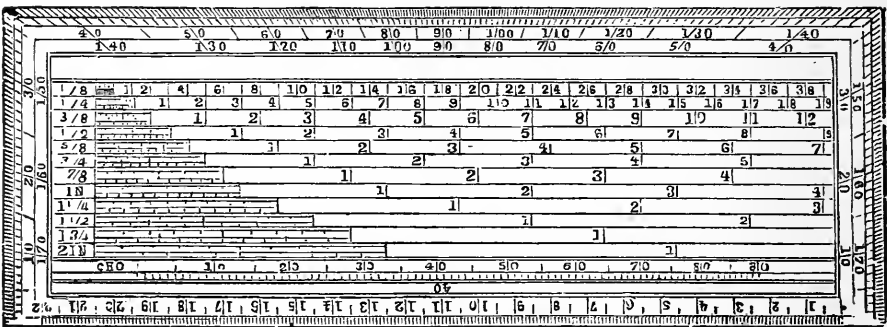
516

515.	Semi-circular Horn Protractor , $4\frac{1}{2}$ inch, 1°	12
516.	" " " $5\frac{1}{4}$ " $\frac{1}{2}^{\circ}$	20
517.	" " " $6\frac{1}{4}$ " $\frac{1}{2}^{\circ}$	25
518.	" " " 7 " $\frac{1}{2}^{\circ}$	40
519.	" " " 8 " $\frac{1}{2}^{\circ}$	50
520.	" " " $8\frac{3}{4}$ " $\frac{1}{2}^{\circ}$	65
521.	Circular " " 4 " 1°	1 00
522.	" " " $5\frac{1}{8}$ " $\frac{1}{2}^{\circ}$	1 25
523.	" " " $6\frac{1}{4}$ " $\frac{1}{2}^{\circ}$	1 50
524.	Square " " $4\frac{3}{4}$ " $\frac{1}{2}^{\circ}$	35
525.	" " " 6 " $\frac{1}{2}^{\circ}$	50
526.	Railroad Curve Protractor , horn, 8 inch, $\frac{1}{2}^{\circ}$, with circular curves, from $\frac{1}{2}^{\circ}$ to 8° , scale 400 feet to the inch.....	1 50
527.	Square Boxwood Protractor , 6 inches long, $1\frac{3}{4}$ inches wide, divided, whole degrees, 4 scales, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, 1 inch, diagonal scales, scale of chords.....	35

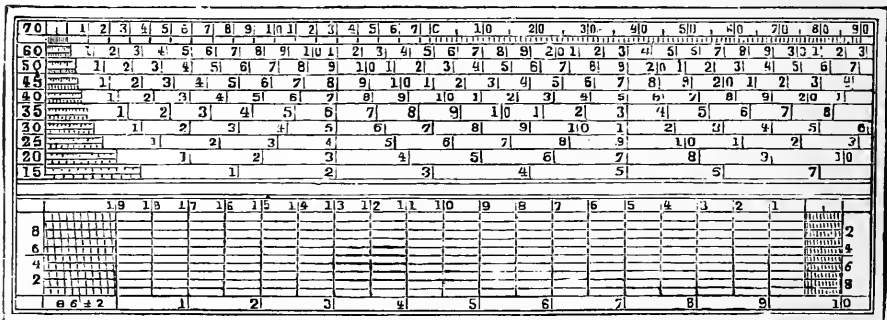


PROTRACTORS.

- No. Each.
- 528. Square Ivory Protractor**, 6 inches long, $1\frac{3}{4}$ inches wide, divided, whole degrees, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, 1 inch scales, scale of chords, diagonal scales, scales of 25, 30, 35, 40, 45 parts per inch..... \$1 60
- 529. Square Ivory Protractor**, 6 inches long, $1\frac{3}{4}$ inches wide, divided, whole degrees, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1 inch scales, scale of chords, diagonal scale, scales of 30, 35, 40, 45, 50, 60 parts per inch..... 2 00



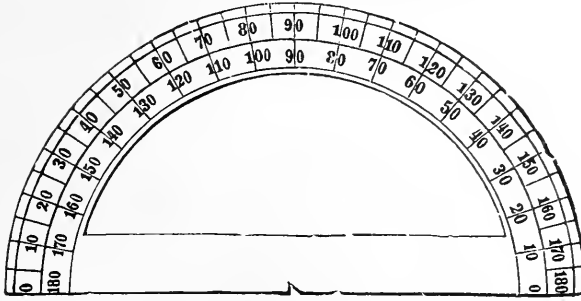
530



530—Back.

- 530. Square Ivory Protractor**, 6 inches long, 2 inches wide, divided, whole degrees, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{1}{2}$ inch scales, scale of chords, diagonal scale, scales of 30, 35, 40, 45, 50, 60 parts per inch..... 4 35

PROTRACTORS.

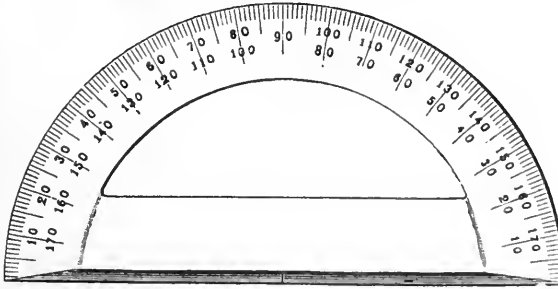


535-542

No.						Each.
535.	Semi-Circular Protractor, brass		$3\frac{3}{4}$ inch,	1°		\$0 10
536.	"	"	$4\frac{1}{4}$ "	$\frac{1}{2}^\circ$		20
537.	"	"	$5\frac{1}{8}$ "	$\frac{1}{2}^\circ$		50
538.	"	"	$6\frac{3}{8}$ "	$\frac{1}{2}^\circ$		55
539.	"	"	German silv., $4\frac{1}{4}$ "	1°		55
540.	"	"	" $5\frac{1}{8}$ "	$\frac{1}{2}^\circ$		80
541.	"	"	" $6\frac{3}{8}$ "	$\frac{1}{2}^\circ$		95
542.	"	"	" $7\frac{1}{2}$ "	$\frac{1}{2}^\circ$		1 20
543.	"	"	" $8\frac{1}{2}$ "	$\frac{1}{2}^\circ$		1 60

SWISS PROTRACTORS.

Of German Silver.

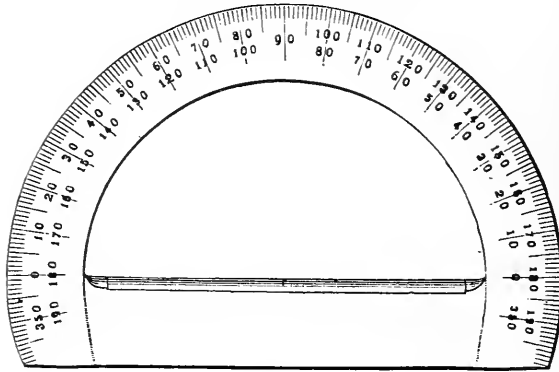


545

545.	Semi-circular Protractor, 4 inch, German silver, beveled edge, center on outer edge, divided to 1° degree.....	1 60
546.	Semi-circular Protractor, 5 inch, German silver, beveled edge, center on outer edge, divided to $\frac{1}{2}^\circ$ degree.....	2 25
547.	Semi-circular Protractor, 6 inch, German silver, beveled edge, center on outer edge, divided to $\frac{1}{2}^\circ$ degree.....	2 75
548.	Semi-circular Protractor, 6 inch, German silver, beveled edge, center on outer edge, divided to $\frac{1}{4}^\circ$ degree.....	3 50
549.	Semi-circular Protractor, 7 inch, German silver, beveled edge, center on outer edge, divided to $\frac{1}{2}^\circ$ degree.....	4 50
550.	Semi-circular Protractor, 8 inch, German silver, beveled edge, center on outer edge, divided to $\frac{1}{2}^\circ$ degree.....	5 25

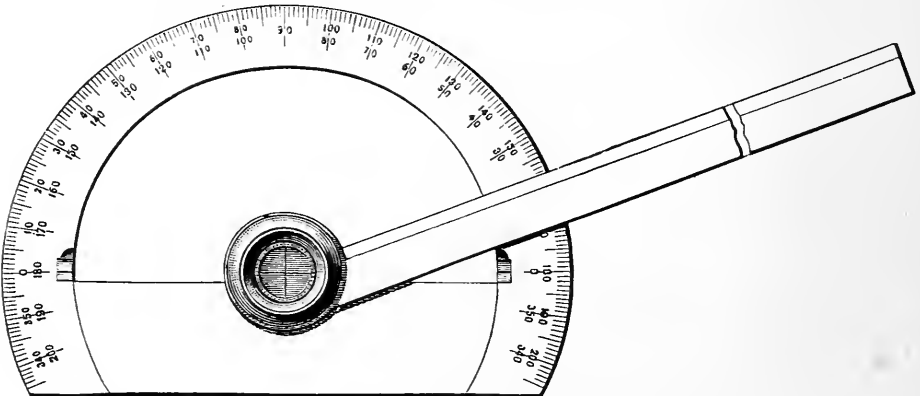


SWISS PROTRACTORS, Of German Silver.



545-A

No.		Each.
545A.	Semi-circular Protractor, 4 inch, German silver, beveled edge, center on inner edge, divided to 1 degree.....	\$2 35
546A.	Semi-circular Protractor, 5 inch, German silver, beveled edge, center on inner edge, divided to $\frac{1}{2}$ degree.....	3 00
547A.	Semi-circular Protractor, 6 inch, German silver, beveled edge, center on inner edge, divided to $\frac{1}{2}$ degree.....	3 50
548A.	Semi-circular Protractor, 6 inch, German silver, beveled edge, center on inner edge, divided to $\frac{1}{4}$ degree.....	4 25
549A.	Semi-circular Protractor, 7 inch, German silver, beveled edge, center on inner edge, divided to $\frac{1}{2}$ degree.....	5 25
550A.	Semi-circular Protractor, 8 inch, German silver, beveled edge, center on inner edge, divided to $\frac{1}{2}$ degree.....	6 50

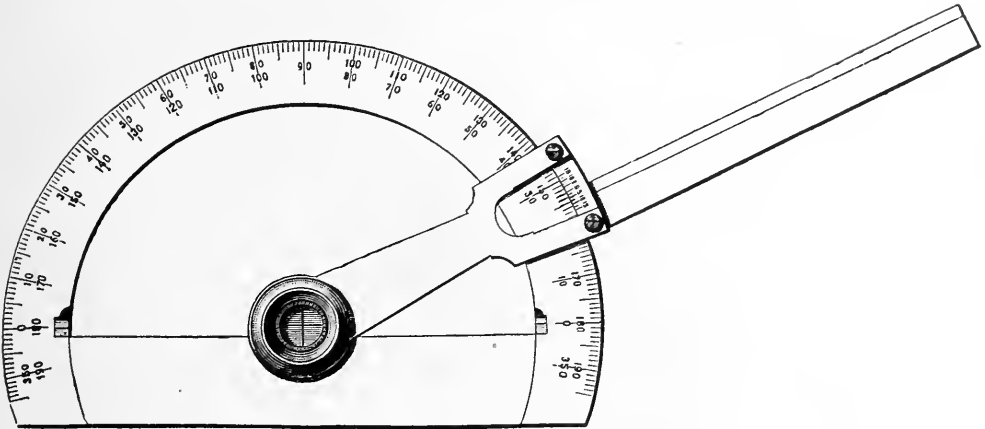


551.

551.	Semi-circular Protractor, German silver, 6 inch, with horn center and movable arm, divided to $\frac{1}{2}$ degree	7 50
552.	Semi-circular Protractor, German silver, 7 inch, with horn center and movable arm, divided to $\frac{1}{2}$ degree.....	9 00



SWISS PROTRACTORS, Of German Silver.

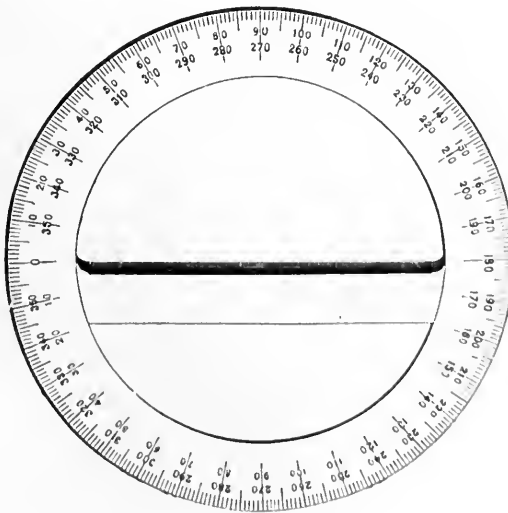


No.

553

Each.

- 553. Semi-circular Protractor**, German silver, $5\frac{1}{2}$ inch, with horn center and movable arm, divided to $\frac{1}{2}$ degree, vernier reading to 3 minutes.....\$11 00
- 554. Semi-circular Protractor**, German silver, 8 inch, with horn center and movable arm, divided to $\frac{1}{2}$ degree, vernier reading to 1 minute 14 50
- 555. Semi-circular Protractor**, German silver, 10 inch, with horn center and movable arm, divided to $\frac{1}{4}$ degree, vernier reading to 1 minute..... 18 00



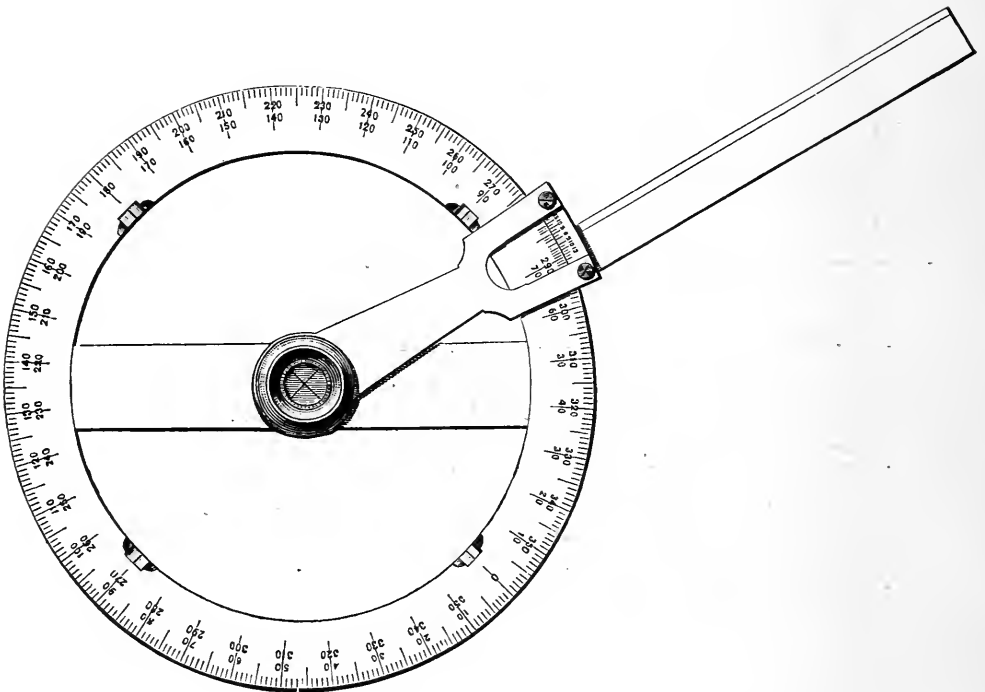
556

- 556. Circular Protractor**, German silver, 5 inch, divided to $\frac{1}{2}$ degree..... 7 00



SWISS PROTRACTORS,

Of German Silver.



No.

557

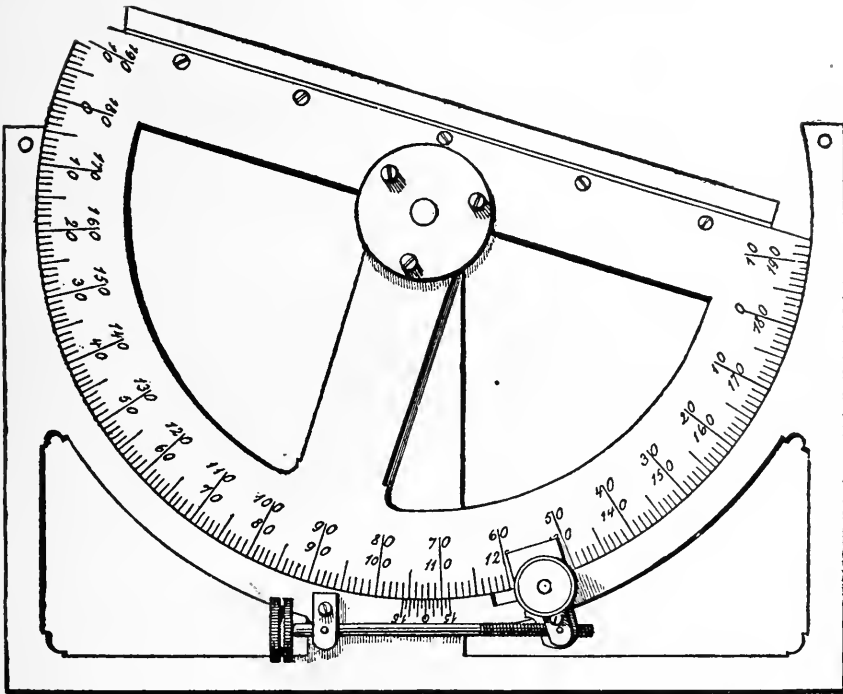
Each.

- 557. Circular Protractor**, German silver, $5\frac{1}{2}$ inch, with horn center and movable arm, divided to $\frac{1}{2}$ degree, vernier reading to 3 minutes.....\$14 00
- 558. Circular Protractor**, German silver, 8 inch, with horn center and movable arm, divided to $\frac{1}{4}$ degree, vernier reading to 1 minute..... 16 25
- 559. Circular Protractor**, German silver, 10 inch, with horn center and movable arm, divided to $\frac{1}{2}$ degree, vernier reading to 1 minute..... 20 00

Cases for protractors, of wood, covered with morocco, lined with velvet, according to the size, from \$1 50 to \$5 00.

A.H. ABBOTT & CO., CHICAGO.

CROZET PROTRACTOR.



565

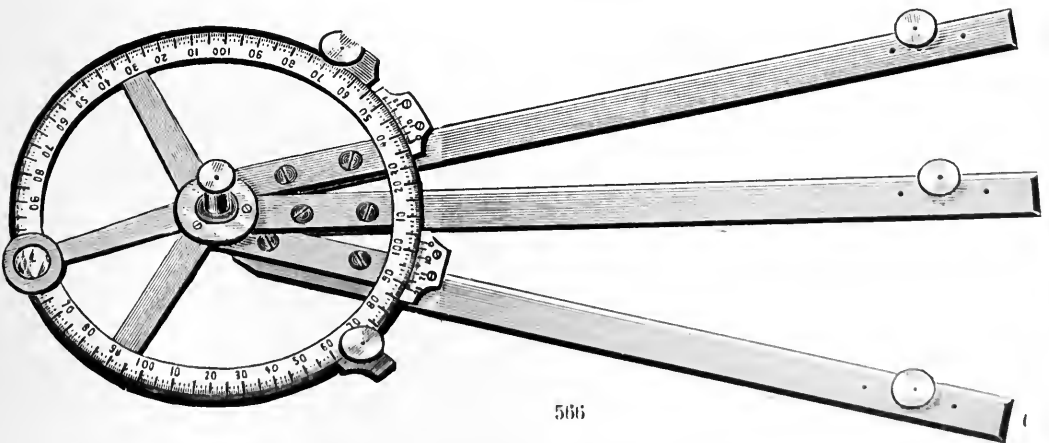
No.

Each.

565. Crozet Protractor, 8 inch, $\frac{1}{4}$ degrees, with vernier reading to 1 minute, and with tangent screw, polished case.....\$40 00

A very useful instrument, which may be used along a straight edge and angles set off without taking the trouble of bringing the center of the protractor over the starting point.

STATION POINTER.



566

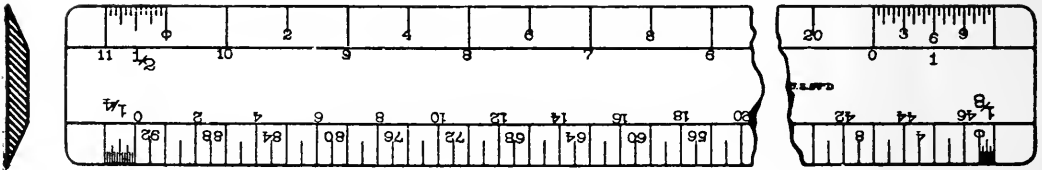
566. Station Pointer, or Three Arm Protractor, $6\frac{1}{2}$ inch diameter, 17 inch long arms which may be lengthened to $27\frac{1}{2}$ inch, divided to $\frac{1}{2}$ degrees, with verniers on two outer arms reading to 1 minute, and vernier lens. In mahogany case..... 80 00



FLAT IVORY SCALES.

Machine Divided.

U. S. Standard.

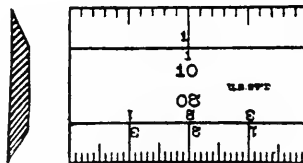


571

No.											Each.
570.	Flat Ivory Scale, 6 inch, divided	$\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1 inch to the foot,	\$2	00							
571.	"	"	12	"	"	$\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1	"	"	"	"	3 00
572.	"	"	12	"	"	$\frac{3}{8}$, $\frac{3}{4}$, $1\frac{1}{2}$, 3	"	"	"	"	3 00

IVORY CHAIN SCALES.

573.	Flat Ivory Chain Scale, 6 inch, div. 10x 50 parts to the inch,	2	00
574.	" " " " 6 " " 20x 40 " " "	2	00
575.	" " " " 6 " " 30x 60 " " "	2	00
576.	" " " " 6 " " 80x100 " " "	2	50
577.	" " " " 12 " " 10x 50 " " "	3	00
578.	" " " " 12 " " 20x 40 " " "	3	00
579.	" " " " 12 " " 30x 60 " " "	3	00
580.	" " " " 12 " " 80x100 " " "	3	75



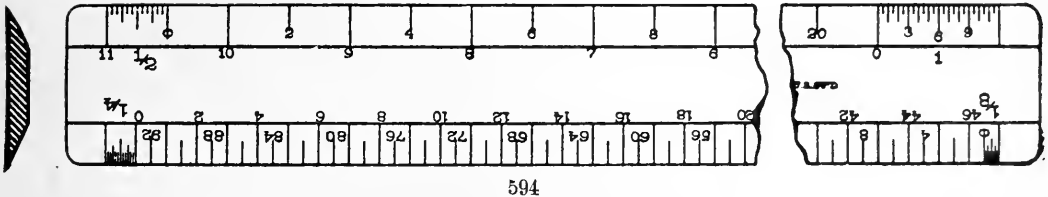
581A

581.	Flat Ivory Offset Scale, 2 inch, div. 10x 50 parts to the inch,	80
581A.	" " " " 2 " " 10x 20 " " "	80
582.	" " " " 2 " " 20x 40 " " "	80
583.	" " " " 2 " " 30x 60 " " "	80
584.	" " " " 2 " " 80x100 " " "	1 00

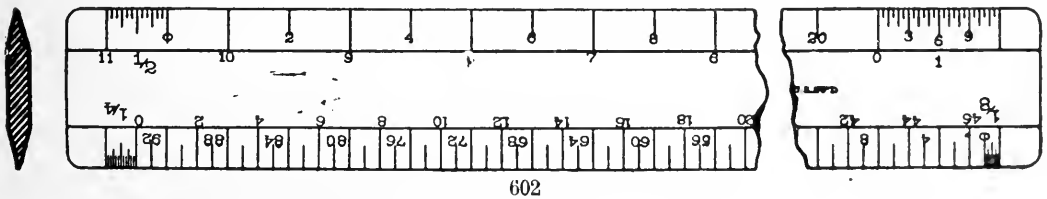


FLAT BOXWOOD SCALES.

Machine Divided. U. S. Standard.



No.							Each.
593.	Flat Boxwood Scale,	6 in.,	div. $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1 in.	to the foot..	\$0 50		
594.	"	"	12 "	" $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1 "	"	..	75
595.	"	"	12 "	" $\frac{3}{8}$, $\frac{3}{4}$, $1\frac{1}{2}$, 3 "	"	..	75
596.	"	"	12 $\frac{1}{2}$ "	" $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1 "	"	..	85
No. 596 has the advantage of covering 100 feet on $\frac{1}{8}$ inch, 50 feet on $\frac{1}{4}$ inch, and 25 feet on $\frac{1}{2}$ inch scale.							
597.	Flat Boxwood Scale,	18 in.,	div. $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1 in.	to the foot..	1 50		
598.	"	"	18 "	" $\frac{3}{8}$, $\frac{3}{4}$, $1\frac{1}{2}$, 3 "	"	..	1 50
599.	"	"	24 "	" $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1 "	"	..	2 00
600.	"	"	24 "	" $\frac{3}{8}$, $\frac{3}{4}$, $1\frac{1}{2}$, 3 "	"	..	2 00
601.	"	"	24 "	" $\frac{1}{8}$, $\frac{1}{4}$, inch to the foot, $\frac{1}{16}$ inch, full size.....	2 00		



602.	Flat Boxwood Scale,	12 inch,	beveled and divided on both sides, div. $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, $1\frac{1}{2}$, $\frac{3}{4}$, $1\frac{1}{2}$, 3 inch to the foot.....	1 20
603.	Flat Boxwood Scale,	18 inch,	beveled and divided on both sides, div. $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, $1\frac{1}{2}$, $\frac{3}{4}$, $1\frac{1}{2}$, 3 inch to the foot.....	2 25
604.	Flat Boxwood Scale,	24 inch,	beveled and divided on both sides, div. $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, $1\frac{1}{2}$, $\frac{3}{4}$, $1\frac{1}{2}$, 3 inch to the foot.....	3 00

Second Quality Flat Boxwood Scales.

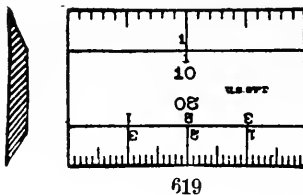
605.	Flat Scale,	6 inch,	divided, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1 inch to the foot.....	30
606.	"	12 "	" $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1 " " "	50
607.	"	12 "	beveled on both sides, divided, one side $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$ and 1 inch; reverse side $\frac{3}{8}$, $\frac{3}{4}$, $1\frac{1}{2}$ and 3 inches to the foot.....	1 00
608.	Boxwood Plotting Scale,	6 inch.....		10
609.	Ivory	" " 6 "		1 00



FLAT BOXWOOD CHAIN SCALES.

Machine Divided. U. S. Standard.

No.										Each.
610.	Flat Boxwood Chain Scale, 6 in. div. 10x 50 parts to the inch									\$0 50
611.	"	"	"	"	6	"	20x 40	"	"	50
612.	"	"	"	"	6	"	30x 60	"	"	50
613.	"	"	"	"	6	"	80x100	"	"	1 00
614.	"	"	"	"	12	"	10x 50	"	"	75
615.	"	"	"	"	12	"	20x 40	"	"	75
616.	"	"	"	"	12	"	30x 60	"	"	75
617.	"	"	"	"	12	"	80x100	"	"	1 50



618.	Flat Boxwood Offset Scale, 2 in., div. 10x 50 parts to the inch										50
619.	"	"	"	"	2	"	10x 20	"	"	"	50
620.	"	"	"	"	2	"	20x 40	"	"	"	50
621.	"	"	"	"	2	"	30x 60	"	"	"	50
622.	"	"	"	"	2	"	80x100	"	"	"	1 00
623.	Flat Boxwood Chain Scale, 12 in., div. 100x 500 parts to the ft.										1 00
624.	"	"	"	"	12	"	200x 400	"	"		1 00
625.	"	"	"	"	12	"	300x 600	"	"		1 00
626.	"	"	"	"	12	"	800x1000	"	"		2 00

FLAT BOXWOOD METRIC SCALES.

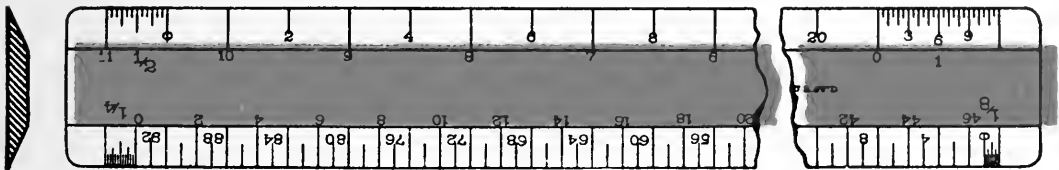
627.	Flat Boxwood Scale, 10 centimeter long.....								50
628.	"	"	"	20	"	"	.....		60
629.	"	"	"	30	"	"	.....		75
630.	"	"	"	50	"	"	.....		1 50

FLAT WHITE EDGE SCALES.

Machine Divided. U. S. Standard.

These scales are made of the best seasoned boxwood. The bevels are lined with a material resembling ivory, which will permanently remain white, and will not shrink. The White Edge Drafting Scales are a great and decided improvement over all other scales now in use. They combine durability and distinctness, and will not tire nor injure the eyes, because they are even more distinct and legible than ivory scales.

Divided: Inch to the Foot.



624

No.							Each.
624W.	White Edge Scale, 6 inch, div. $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1 inch to foot....						\$0 75
625W.	"	"	"	12	"	$\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1	1 25
626W.	"	"	"	12 $\frac{1}{2}$	"	$\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1	1 35
No. 626W has the advantage of covering 100 feet on $\frac{1}{8}$ inch, 50 feet on $\frac{1}{4}$ inch, and 25 feet on $\frac{1}{2}$ inch scale.							
627W.	White Edge Scale, 18 inch, div. $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1 inch to foot...						2 25
628W.	"	"	"	24	"	$\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1	3 00
629W.	"	"	"	24	"	$\frac{1}{8}$, $\frac{1}{4}$, inch full size,	3 00
631W.	"	"	"	12	"	$\frac{3}{8}$, $\frac{3}{4}$, $1\frac{1}{2}$, 3 inch to foot..	1 25
632W.	"	"	"	18	"	$\frac{3}{8}$, $\frac{3}{4}$, $1\frac{1}{2}$, 3	2 25
633W.	"	"	"	24	"	$\frac{3}{8}$, $\frac{3}{4}$, $1\frac{1}{2}$, 3	3 00

Divided: Inches and Tenths.

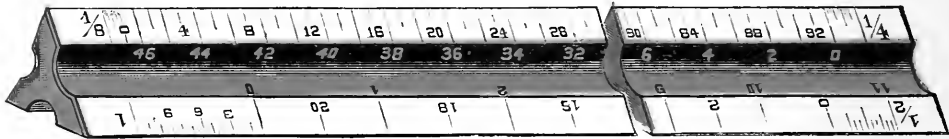
635W.	White Edge Chain Scale, 6 inch, div. 10x 50 parts to inch,						75
636W.	"	"	"	6	"	20x 40	75
637W.	"	"	"	6	"	30x 60	75
638W.	"	"	"	6	"	80x100	1 35
639W.	"	"	"	12	"	10x 50	1 25
640W.	"	"	"	12	"	20x 40	1 25
641W.	"	"	"	12	"	30x 60	1 25
642W.	"	"	"	12	"	80x100	1 75



TRIANGULAR WHITE EDGE SCALES,

ARCHITECTS'.

Machine Divided. U. S. Standard.



644W

No.		Each.
643W.	White Edge Scale, 6 inch, divided $\frac{3}{8}$, $\frac{3}{16}$, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{2}$, 3 inch to the foot, $\frac{1}{16}$ inch.....	\$1 50
644W.	White Edge Scale, 12 inch, divided $\frac{3}{8}$, $\frac{3}{16}$, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{2}$, 3 inch to the foot, $\frac{1}{16}$ inch.....	2 50
645W.	White Edge Scale, 12 inch, divided $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{2}$, 2, 3, 4 inch to the foot, $\frac{1}{16}$ inch.....	2 50
646W.	White Edge Scale, 18 inch, divided $\frac{3}{8}$, $\frac{3}{16}$, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{2}$, 3 inch to the foot, $\frac{1}{16}$ inch.....	4 50
647W.	White Edge Scale, 24 inch, divided $\frac{3}{8}$, $\frac{3}{16}$, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{2}$, 3 inch to the foot, $\frac{1}{16}$ inch.....	6 50

TRIANGULAR WHITE EDGE SCALES,

ENGINEERS'.

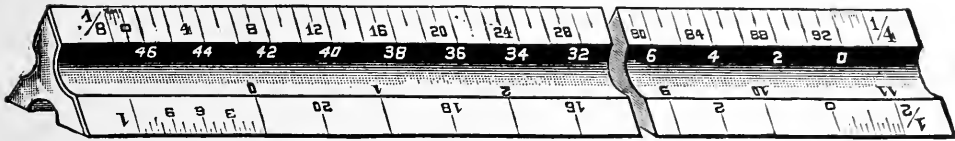
Machine Divided. U. S. Standard.

648W.	White Edge Chain Scale, 6 inch, divided 10, 20, 30, 40, 50, 60 parts to the inch.....	1 50
649W.	White Edge Chain Scale, 12 inch, divided 10, 20, 30, 40, 50, 60 parts to the inch.....	2 50
650W.	White Edge Chain Scale, 12 inch, divided 20, 30, 40, 50, 60, 80 parts to the inch.....	2 50
651W.	White Edge Chain Scale, 18 inch, divided 10, 20, 30, 40, 50, 60 parts to the inch.....	4 50
652W.	White Edge Chain Scale, 24 inch, divided 10, 20, 30, 40, 50, 60 parts to the inch.....	6 50



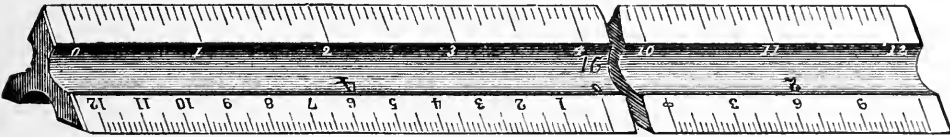
TRIANGULAR BOXWOOD SCALES.

Machine Divided. U. S. Standard.



681

No.		Each.
680.	Triangular Boxwood Scale , divided, $\frac{3}{8}$, $\frac{3}{16}$, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{2}$, 3 inches to the foot, $\frac{1}{16}$ inch, 6 inch.....	\$0 75
681.	Same as No. 680, 12 inch.....	1 00
682.	18 inch, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{2}$, 2, 3, 4 inch to the foot, $\frac{1}{16}$ inch..	2 50
683.	24 inch, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{2}$, 2, 3, 4 inch to the foot, $\frac{1}{16}$ inch..	4 25
684.	Triangular Boxwood Chain Scale , divided 10, 20, 30, 40, 50, 60 parts to the inch, 6 inch.....	75



685

685.	Triangular Boxwood Chain Scale , divided 10, 20, 30, 40, 50, 60 parts to the inch, 12 inch.....	1 00
686.	Triangular Boxwood Chain Scale , divided 10, 20, 30, 40, 50, 60 parts to the inch, 18 inch.....	2 50
687.	Triangular Boxwood Chain Scale , divided 10, 20, 30, 40, 50, 60 parts to the inch, 24 inch.....	4 25
688.	Triangular Boxwood Chain Scale , divided 20, 30, 40, 50, 60, 80 parts to the inch, 12 inch.....	1 25
689.	Triangular Boxwood Chain Scale , divided 20, 30, 40, 50, 60, 80 parts to the inch, 18 inch.....	2 50
690.	Triangular Boxwood Chain Scale , 12 inch, divided 100, 200, 300, 400, 500, 600 parts per foot.....	1 75
691.	Triangular Boxwood Chain Scale , 12 inch, divided 200, 300, 400, 500, 600, 800, 1,000 parts per foot.....	5 00
692.	Triangular Boxwood Offset Scale , 2 inch, to match Nos. 684 to 687.....	60

METRIC TRIANGULAR SCALES.

693.	Triangular Boxwood Scale , 20 cm. long.....	1 25
694.	" " " 30 "	1 50
695.	" " " 50 "	2 75

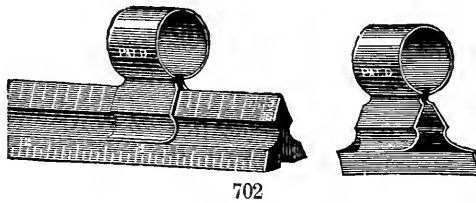
Special scales made to order. Sets of scales, as may be selected, furnished in finely polished cases.



METALLIC TRIANGULAR SCALES.

Machine Divided. U. S. Standard.

No.		Each.
701.	Triangular Metallic Scale, divided $\frac{3}{8}$, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{2}$, 3 inches to the foot, $\frac{1}{16}$ inch	\$3 00
701A.	Triangular Metallic Scale, divided 10, 20, 30, 40, 50 and 60 parts to the inch	3 00
701B.	Triangular Metallic Scale, divided 20, 30, 40, 50, 60 and 80 parts to the inch	3 00



702.	Triangular Scale Guard	15
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A very useful attachment to the triangular scale, to obviate the liability to error, and the loss of time caused by the necessity of a careful examination of the scale each time it is used.

PAPER SCALES.

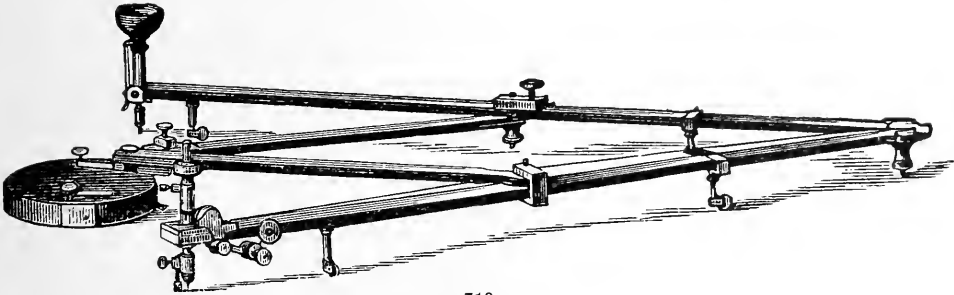
Engine Divided, Printed on Bristol Board.

19 Inches Long, 1 3/4 Inches Wide.

The advantages of these scales are: They expand and contract nearly the same as drawing paper, do not soil the work, and distances can be set off from them without the use of dividers.

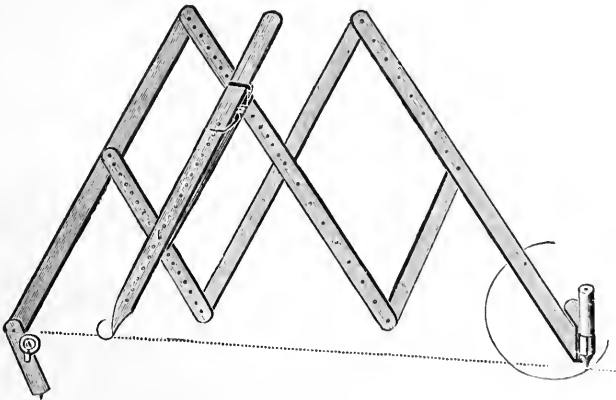
No.		Per set.
705.	Series A, 6 in set, divided, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{2}$, 3 inch to the foot	\$1 00
706.	Series B, 6 in set, divided, $\frac{3}{8}$, $\frac{1}{8}$, $\frac{1}{16}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{8}$ inch to the foot	1 00
707.	Series C, 6 in set, divided, 10, 20, 30, 40, 50, 60 parts per inch	1 00
	Single scales of the above	Each. 20
	" " divided, 2, 4 inch to the foot, 66 parts per inch	20
708.	Meter and Inch Comparing Scales, $\frac{1}{2}$ meter long	30

PANTOGRAPHS.



710

No.		Each.
710.	Pantograph , of square brass tubes, for reducing and enlarging engravings, plans, drawings, etc., of the best construction, and with all the latest improvements, in a strong wooden case, arms 24 inches long.....	\$67 00
711.	Same as No. 710, arms 28 inches long.....	81 50
712.	" " 710, " 33 " "	97 00

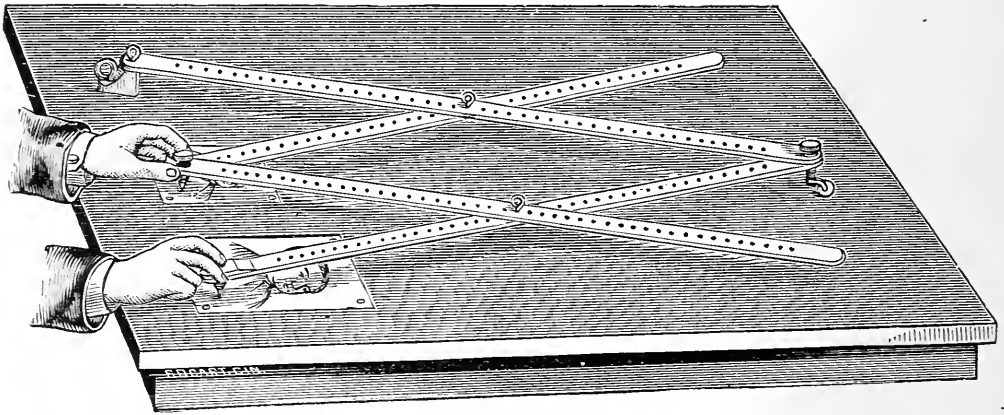


715

715.	Pantograph , made of steel, nickel-plated to prevent rusting. Size when folded up about 10 inches in length. With this perfect little instrument accurate enlarging can be done. It will enlarge from one to twenty-nine diameters. In box, with directions.....	3 00
------	---	------

DIRECTIONS FOR USE:—The foot of the instrument is fastened to the drawing board on the left. To the right is fastened the drawing paper, and at the left of this is fastened the copy to be drawn from. The point rests on the picture, or other object to be copied, and by guiding the point over the lines and shadings of the picture, the pencil held in the hand having a corresponding movement, copies as fast as the point traces the picture. If it is desired to make a very large drawing from a small copy, take a sketch upon a small sheet, then use the sketch to enlarge from.

PANTOGRAPHS.



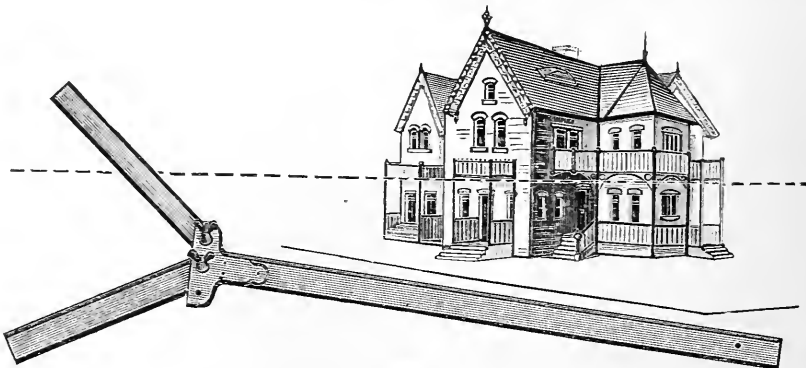
No.		718	Each.
718.	Pantograph, of hard wood, with brass mountings, for reducing and enlarging drawings.....		\$2 00
719.	Same as No. 718, plainer finish.....		1 50
720.	Pantograph, of hard wood, simple construction.....		90
721.	" " " common.....		35
722.	" " " small.....		25

THE ART OF DRAWING PORTRAITS

From small photographs to life-size is so mechanical and easy, every outline and shade in the copy being clearly delineated by the instrument, that a successful knowledge may be acquired by a single trial. *Artists, Teachers, Ornamental Painters, Marble Workers, Engravers and Architects* will find this labor-saving instrument invaluable in their business.

It is recommended by teachers as an excellent means of familiarizing children with form and proportion, and greatly assisting them in acquiring a knowledge of the rudiments of drawing by sight from original objects.

CENTROLINEADS OR PERSPECTIVE LINEADS.



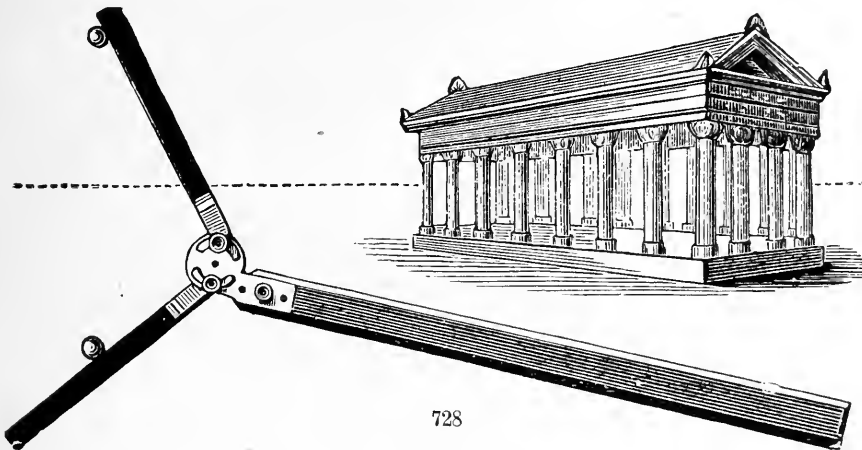
No.		725	Each.
725.	Centrolinead, pearwood, brass swivels with two studs, blade 24 inches long, arms 10 inch.....		\$3 00
726.	Centrolinead, pearwood, brass swivels with two studs, blade 30 inches long, arms 11 inch.....		3 50

CENTROLINEADS OR PERSPECTIVE LINEADS.

- | No. | | Each. |
|-------------|---|--------|
| 727. | Centrolinead , pearwood, brass swivels with two studs, blade 36 inches long, arms 12 inch..... | \$4 00 |

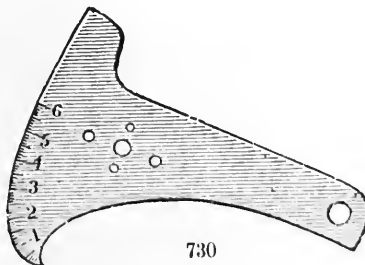
For drawing, both edges of the blade are used. The above illustration shows position of the linead for drawing from the left. In drawing from the right, the upper arm with swivel has to be moved to the lower end of head of blade.

NICHOLSON'S CENTROLINEAD.



- 728.** For perspective drawing, ebony, with German silver mountings, 42 inches long, and two studs.....\$11 00

ODONTOGRAPH.

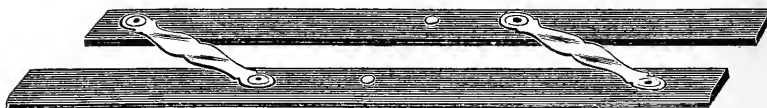


- 730. Templet Odontograph**, for describing teeth of gear wheels, a valuable instrument for millwrights, machinists, pattern makers, etc., with full description, in case..... 3 50

Awarded a medal at the Centennial Exhibition.

"Illustrated Practical Treatise" on the above Odontograph, by Professor S. W. Robinson, 50 cents.

FOLDING PARALLEL RULES.



No.

Each.

745.	Ebony	Parallel	Rule,	brass bars,	6 inch.....						\$0 20
746.	"	"	"	"	9 "	.....					40
747.	"	"	"	"	12 "	.....					55
748.	"	"	"	"	15 "	.....					75
749.	"	"	"	"	18 "	.....					90
750.	"	"	"	"	24 "	.....					1 75
751.	Hard	Rubber	Parallel	Rule,	nickel plated bars, 6 inch...						75
752.	"	"	"	"	"	"	"	9 "	...		90
753.	"	"	"	"	"	"	"	12 "	...	1	20
754.	"	"	"	"	"	"	"	15 "	...	1	50
755.	"	"	"	"	"	"	"	18 "	...	1	75
756.	"	"	"	"	"	"	"	24 "	...	2	50

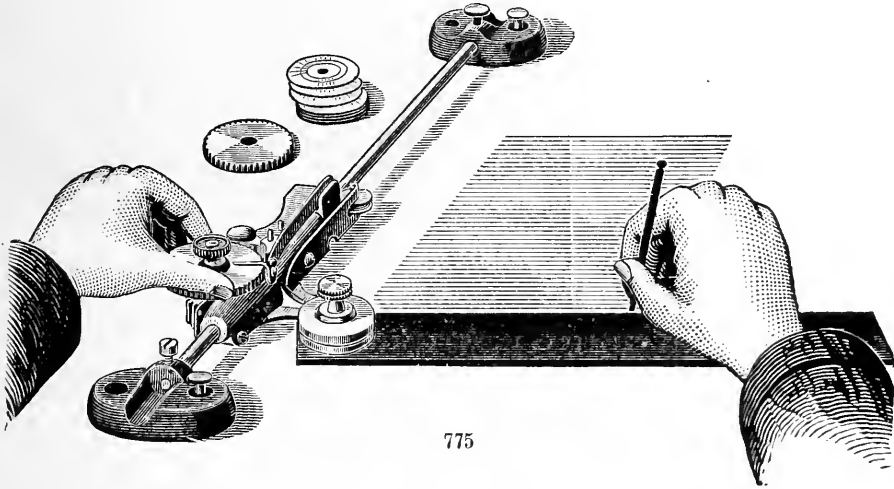
757

757.	Ebony Rolling Parallel Rule,	brass mountings,	9 inch....	2 75
758.	“	“	“ “ “ 12 “	3 25
759.	“	“	“ “ “ 15 “	4 00
760.	“	“	“ “ “ 18 “	5 00
761.	“	“	“ “ “ “ divided	
		ivory edges, 12 inch.....		5 00
762.	Ebony Rolling Parallel Rule,	brass mountings, divided		
		ivory edges, 15 inch.....		6 50
763.	Ebony Rolling Parallel Rule,	brass mountings, divided		
		ivory edges, 18 inch.....		7 50
764.	Solid Brass Rolling Parallel Rule,	in case, 12 inch.....		8 50
765.	“	“ “ “ “ “ 15 “		10 00
766.	“	“ “ “ “ “ 18 “		12 00
767.	“	“ “ “ “ “ 24 “		18 00
768.	German Silver Rolling Parallel Rule,	in case, 12 inch...		10 00
769.	“	“ “ “ “ “ 15 “ ...		12 00
770.	“	“ “ “ “ “ 18 “ ...		15 00
771.	“	“ “ “ “ “ 24 “ ...		20 00



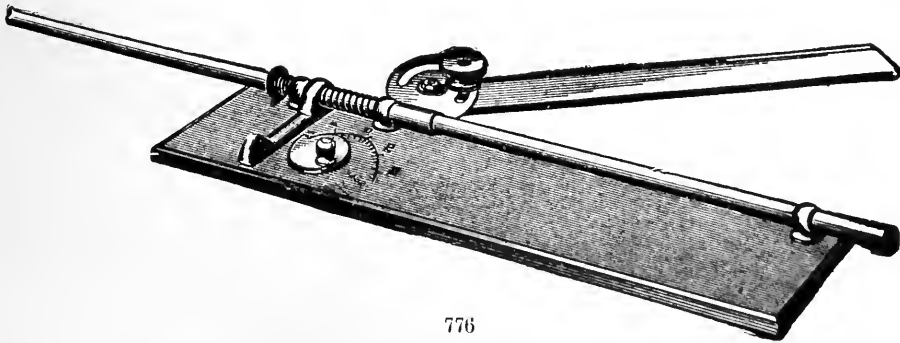
SECTION LINERS.

For draughtmen's, architects', engineers' and surveyors' use in hatching cross section work, planning buildings, brickwork, plotting surveys, map making, designing machinery and tools, and for photo-engraving process work, lithographic designing, in making flat tints, sky tints, graduated, curved, conical and cylindrical line work, and for general draughting.



775

- | | | |
|------|--|--------|
| No. | | Each. |
| 775. | Positive Section Liner , with weights, so as to lie firm on drawing board, in case..... | \$6 50 |



776

- | | | |
|------|---|------|
| 776. | Standard Section Liner , in case | 2 00 |
|------|---|------|
- Strong, simple and durable. Great range of work, allowing space from $\frac{1}{1000}$ to $\frac{1}{2}$ inch, at any angle, without changing position.

Retains its place on the board by means of pins in the bottom of base and without the aid of T-square, straight edge, hands or weights.

The only practical instrument at a reasonable price adapted to the needs of draughtsmen and pupils in mechanical and architectural drawing classes.

No draughtsman should be without this valuable instrument.

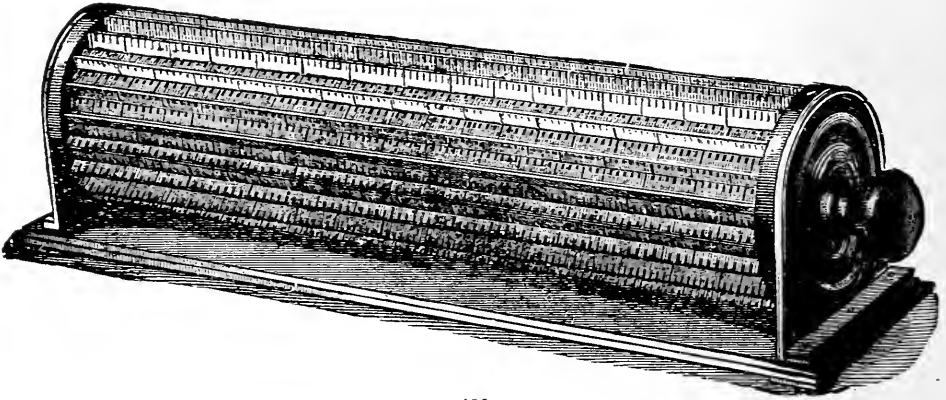
HOW TO WORK IT.

Lay the section liner on the work, with rod and ruler on your right hand side. Begin with ruler all the way up, as shown in cut. After adjusting at A to suit the work, move ruler by pushing and holding B against A with one finger of your left hand.

When ruler gets to the lower end, hold C towards D while pushing rod back to starting point, as shown in cut,



SLIDE RULES.



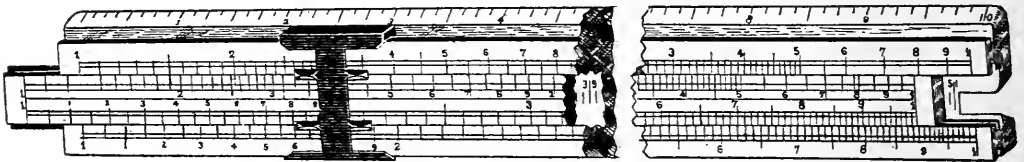
800

Each.

- 800. Thacher's Calculating Instrument**, for performing the greatest variety of useful calculations, with greatest rapidity and accuracy. Cylinder, 18 inch, in polished mahogany box\$35 00
- 801. Thacher's Calculating Instrument**, with reading glass, sliding on a brass bar and adjustable to the different parts of the instrument..... 45 00

A book containing a full description of the instrument and all rules for operating it will be furnished with each instrument.

- 802. Engineer's Boxwood Slide Rule**, 10 inches long, with instructions..... 3 50



803

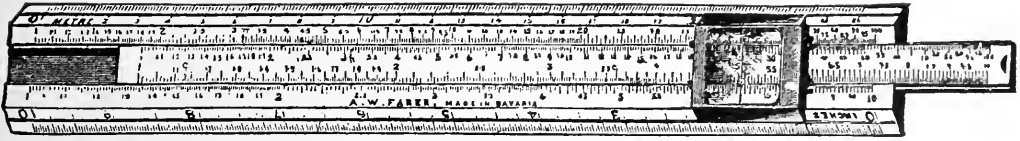
- 803. Engineer's Slide Rule**, (Mannheim) 10 inches long, divided on celluloid white facings, with brass indicator, and instructions..... 4 50
- 804. Engineer's Slide Rule**, (Mannheim) 20 inches long, divided on celluloid white facings, with brass indicator, and instructions..... 16 50

No. 804 has finer divisions, and smaller readings can be accomplished with this rule than with rule No. 803.

Instructions for slide rules 803 and 804, when ordered separately 25



SLIDE RULES.



804A

- | | |
|---|---------------|
| No. | Each. |
| 804A. Calculating Rule and Pamphlet, with plates, giving full descriptions and uses, 10 inches long..... | \$3 60 |

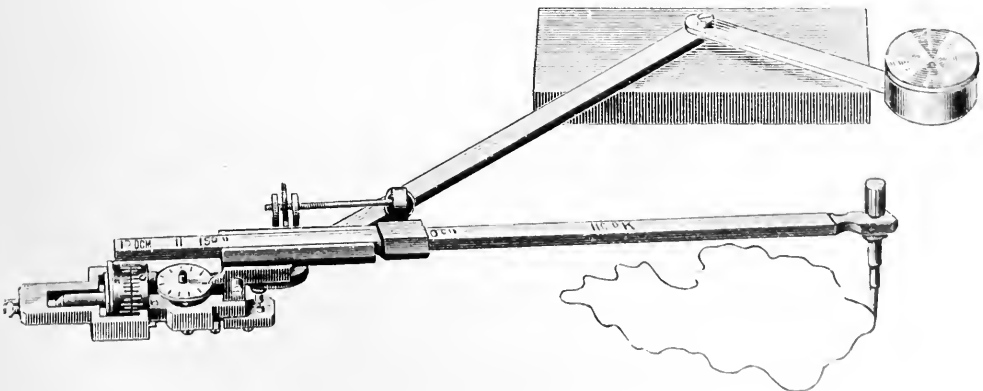
The calculating rule is used for solving quickly multiplications and divisions, and the often complicated connected problems, producing its results with great accuracy and speed, and with a minimum of figures, which is an important consideration in workshop, out of doors, and in the counting room.

This rule has on its upper side a groove, in which the "slide" moves. Each of the two joints between rule and slide divides a calculating scale into two symmetrical halves. The runner or indicator moves backward and forward on the rule, and shows down the center a fine black line, for the purpose of reading the results.

Is useful for ascertaining percentage, square and cubic contents; square root and cube root; proportions; comparison of measures; breaking strain; division of cog-wheels, and many other uses.

This rule has also comparative scale of inches and millimeters, and bevel scales with inches and 32ds and millimeters.

PLANIMETERS.



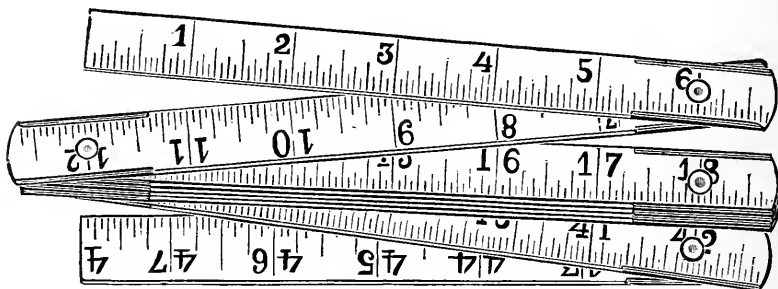
805

- | | |
|---|----------------|
| No | |
| 805. Patent Polar Planimeter, of German silver, for computing areas, with brass weight, in case..... | \$30 00 |
| 806. Polar Planimeter, to measure only square inches, in case... | 15 50 |

The Polar Planimeter is a very important instrument for determining the area of irregular figures, such as railroad profiles, plots of ground, indicator diagrams, etc. It has come into use very extensively, and is indispensable to an engineer who understands it, on account of time and labor saved, and the certainty that the instrument works absolutely correct if properly handled.



POCKET RULES FOR ENGINEERS.



817

No.		Each.
809.	Pocket Rule, 4 feet, 8-fold, divided both sides inches and $\frac{1}{8}$ths,	\$0 25
810.	The same, but divided one side inches and $\frac{1}{8}$ ths, and other side meter and millimeters.....	25
811.	The same, 2 feet, 4-fold, divided both sides inches and $\frac{1}{8}$ ths, or one side inches and $\frac{1}{8}$ ths and other side millimeters.....	10
812.	The same, extra flexible, 4 feet, 8-fold, divided both sides inches and $\frac{1}{8}$ ths.....	40
813.	The same, extra flexible, 2 feet, 4-fold, divided both sides inches and $\frac{1}{8}$ ths, or one side inches and $\frac{1}{8}$ ths, the other side millimeters.....	25
814.	The same, 2 feet, 4-fold, but provided with springs to hold the rule in perfectly straight line when open, divided both sides inches and $\frac{1}{8}$ ths.....	25
815.	The same, 2 feet, 4-fold, with springs, one side divided inches and $\frac{1}{8}$ ths, the other side millimeters.....	35
816.	The same, 3 feet, 6-fold, with springs, both sides divided to inches and $\frac{1}{8}$ ths.....	35
817.	The same, 4 feet, 8-fold, with springs, both sides divided to inches and $\frac{1}{8}$ ths.....	50
818.	The same, 4 feet, 8-fold, with springs, one side divided to inches and $\frac{1}{8}$ ths, the other side divided to meters and millimeters.	60
819.	The same, 5 feet, with springs, 10-fold, both sides divided inches and $\frac{1}{8}$ ths.....	65
820.	The same, 6 feet, with springs, 12-fold, both sides divided inches and $\frac{1}{8}$ ths.....	75
821.	The same, 8 feet, with springs, 16-fold, both sides divided inches and $\frac{1}{8}$ ths.....	1 00

The pocket rules Nos. 809 to 821 deserve special attention. They are lighter and more convenient to carry than the common 2 feet 4-fold pocket rules. Their accuracy is undoubted, as by a peculiar preparation of the wood, shrinkage is prevented entirely. No. 812, a new kind called "infrangible," is very flexible, and can be used for measuring the circumference of objects of comparatively small size.

Nos. 814 to 821 are recommended to architects, engineers and machinists, being provided with springs which keep the rule perfectly straight while open, thus enabling them to take perpendicular or horizontal measurements without being annoyed by the rule folding itself; this is done without the trouble generally experienced in the ordinary pocket rules.

SCALE RULES.

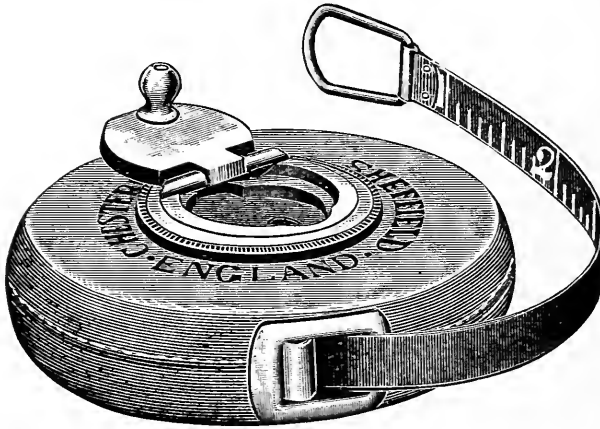
No.	Each.
822. Ivory Joint Rule , 2 feet, 4-fold, German silver mounted, divided outside $\frac{1}{8}$, $\frac{1}{10}$, $\frac{1}{5}$, $\frac{1}{12}$, $\frac{1}{16}$ ths of an inch, edge foot in 100ths, inside on beveled side, $\frac{1}{16}$, $\frac{3}{16}$, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$ and 3 inch to the foot, main joint is graduated to 5 degrees to set off angles,.....	\$7 00
823. Boxwood Joint Rule , 2 feet, 4-fold, German silver mounted, divided like No. 822.....	2 00
824. Boxwood Joint Rule , 2 feet, 4-fold, brass mounted, with 8 scales on beveled edge of $\frac{1}{16}$, $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$ and 1 inch to the foot, outside $\frac{1}{8}$, $\frac{1}{10}$, $\frac{1}{12}$ and $\frac{1}{16}$	1 25
825. Same as No. 824, with 4 scales, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$ inch to the foot, outside $\frac{1}{8}$, $\frac{1}{10}$, $\frac{1}{12}$ and $\frac{1}{16}$	75

SCHOOL RULES.

826. Maple School Rule , 12 inches long, divided $\frac{1}{16}$ inch.....	08
827. Boxwood School Rule , 12 inches, one side $\frac{1}{16}$ inch, reverse side $\frac{1}{8}$ inch.....	10
828. Boxwood School Rule , 12 inches, one side metric.....	15
829. Boxwood School Rule , triangular, 12 inch, with handle, one edge divided to inches and $\frac{1}{16}$ ths, the other edge divided to centimeter and millimeters.....	50

MEASURING TAPES.

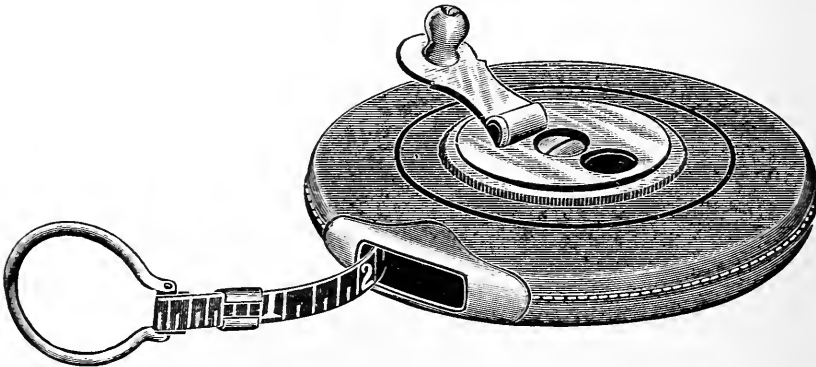
Made of Steel.



830

No. **830. Chesterman's Steel Tape**, $\frac{3}{8}$ inch wide, with flush handle, red leather case. Tape divided in $\frac{1}{10}$ ths and links, or in $\frac{1}{2}$ ths and links. Each.

25 feet.....	\$4 50
33 "	5 20
50 "	7 20
66 "	9 20
75 "	10 40
100 "	12 80



831

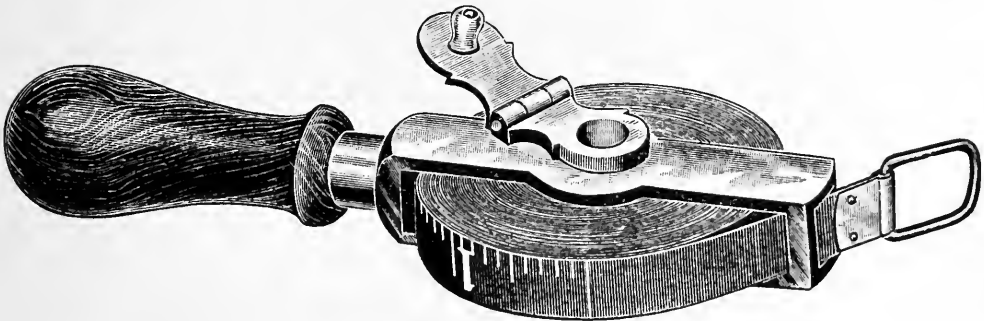
831. Eddy's Patent Improved Steel Tape, $\frac{1}{4}$ inch wide, folding handle, metal case, morocco covered. Tape divided in $\frac{1}{10}$ ths and links, or in $\frac{1}{2}$ ths and links.

25 feet.....	4 00
33 "	4 50
50 "	6 00
66 "	8 00
75 "	10 00
100 "	12 00

MEASURING TAPES.

Made of Steel.

No.		Each.
832.	Eddy's Patent Improved Steel Tape, $\frac{1}{4}$ inch wide, flush handle, red leather case, tape divided in $\frac{1}{10}$ths and links, or in $\frac{1}{12}$ths and links.	
33 feet	.....	\$5 50
50 "	.....	8 00
66 "	.....	10 00
75 "	.....	12 00
100 "	.....	15 00
832A.	Detachable Compensatory Handles, graduated for variation of temperature, per pair.....	3 00



833

833.	Steel Tapes, $\frac{1}{2}$ inch wide, on brass frame with folding handle, divided in $\frac{1}{10}$ths and links, or $\frac{1}{12}$ths and links.	
50 feet	.....	6 00
100 "	.....	10 00

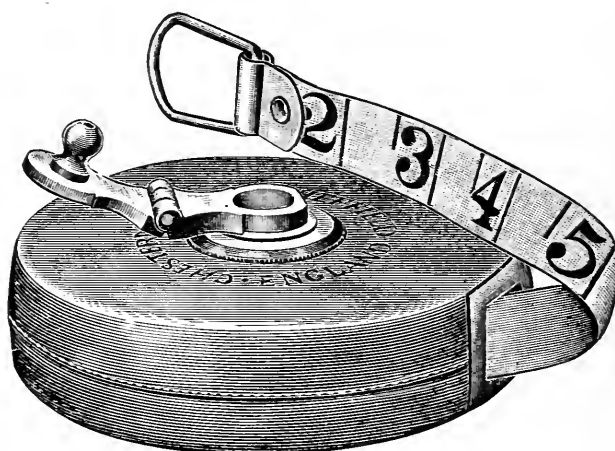
Tape No. 833, not being contained in a case, is especially well adapted for use in mines, sewers, etc., where the tape requires constant cleaning.

834.	Steel Tape, $\frac{5}{16}$-inch wide, folding flush handle, in nickel plated case, a very handy tape, 25 feet long, case $2\frac{1}{8}$ inch diameter, divided in $\frac{1}{10}$ths or $\frac{1}{12}$ths.....	3 60
835.	Steel Tape, $\frac{5}{16}$-inch wide, folding flush handle, in nickel plated case, 25 feet long, case $2\frac{1}{8}$ inch diameter, divided one side $\frac{1}{10}$ths the other side meters, or one side $\frac{1}{12}$ths and the other side meters.....	4 00



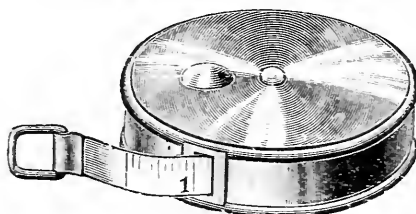
MEASURING TAPES.

Metallic or Wire Woven.



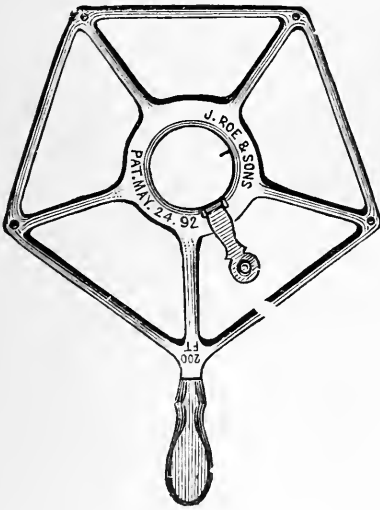
No.	836	Each.
836.	Best English Chesterman's Metallic Tapes, in strong bent leather case, divided $\frac{1}{10}$ths or $\frac{1}{12}$ths.	
25 feet.....		\$1 80
33 "		2 10
50 "		2 60
66 "		3 00
75 "		3 30
100 "		4 50
837.	Best English Chesterman's Metallic Tapes, same as No. 836, but without case.	
50 feet.....		1 50
66 "		1 80
75 "		2 20
100 "		2 90

POCKET TAPES.

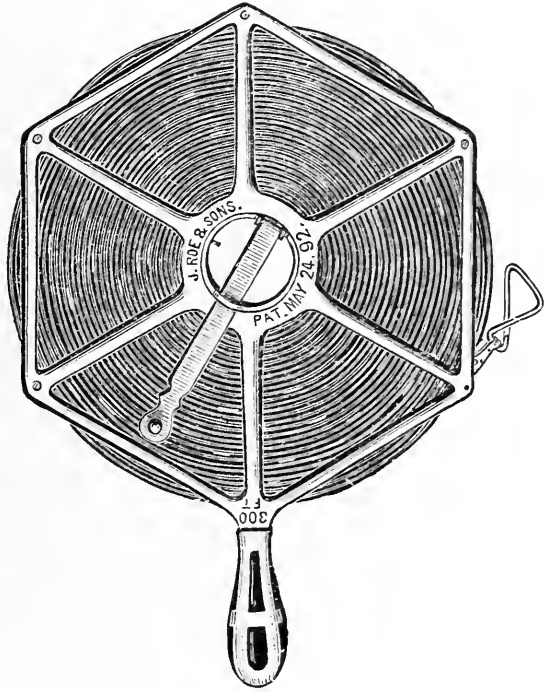


	852	
850.	Best English Linen Pocket Tapes, in German silver case, with stop and spring, divided in inches and meters.	
3 feet.....	\$0 80 | 5 feet.....	1 00
851.	Same as No. 850, but in nickel plated case, round edges.	
3 feet.....	\$0 60 | 6 feet.....	80
852.	Best English Steel Pocket Tapes, in German silver case, with stop and spring, divided in $\frac{1}{16}$ inch and yard, or $\frac{1}{16}$ inch and meter.	
3 feet.....	\$1 25 | 5 feet.....	1 80
853.	Best English Steel Pocket Tapes, in nickel plated case.	
3 feet.....	\$0 80 | 6 feet.....	1 20

ROE'S STEEL TAPE CHAINS, ON ELECTRIC REEL.



858A-858B



854-857

No.	How Graduated.		Plain.	Nickel Plated.	Aluminum Plated.
854A.	100 ft. long,	every foot, end foot in tenths...	\$5 00	\$6 00	\$7 00
854B.	100	" " " " " inches ..	5 00	6 00	7 00
855.	66	" " link.....	5 00	6 00	6 50
856.	66	" " 5 links, each end every link	4 00	5 00	5 50
857A.	50	" " foot, end foot in tenths...	4 00	5 00	5 50
857B.	50	" " " " " inches..	4 00	5 00	5 50
858A.	200	" " " " " tenths ..	7 50	9 00	10 50
858B.	200	" " " " " inches..	7 50	9 00	10 50

858A and 858B are also furnished on hard wood reel, if preferred, at same price.

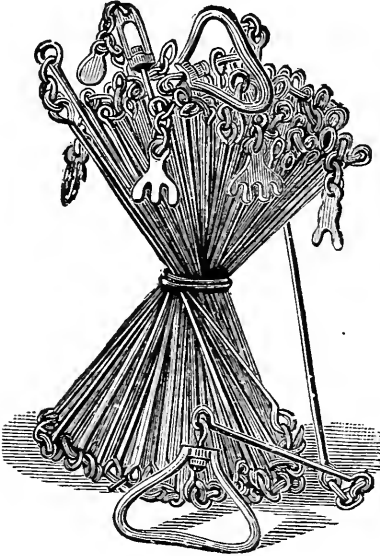
These Tapes are made of superior steel, made to order especially for the purpose, are about $\frac{1}{4}$ inch in width, are graduated every foot or link by brass rivets, and each end foot in tenths or inches. Every 5 feet or link has a *brass* clasp with numbers, and every 10 feet or link has a *copper* clasp with numbers indelibly stamped on both sides thereon. Instructions are sent with every tape and reel how to use them to best advantage. No matter how dirty or rusty the tape may be, the rivets, clasps and figures can be plainly seen. These tapes have detachable handles so as not to catch anywhere when drawn through bush, and are wound up on an electric reel. This reel allows the entire tape open to dry, and the tape can be reeled or unreel as easily and readily as the linen or metallic tapes in cases. Also the tape can be easily detached and used without reel.

The aluminum and nickel plated tapes are *much* less liable to rust and require no oiling or cleaning after being used.

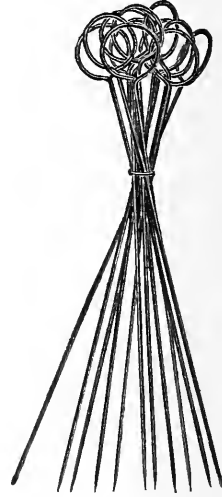
Steel Tape Chains on electric reel, 300, 400 and 500 feet long, furnished at short notice.

SURVEYORS' MEASURING CHAINS AND ARROWS.

Of Steel and Iron.



860



876

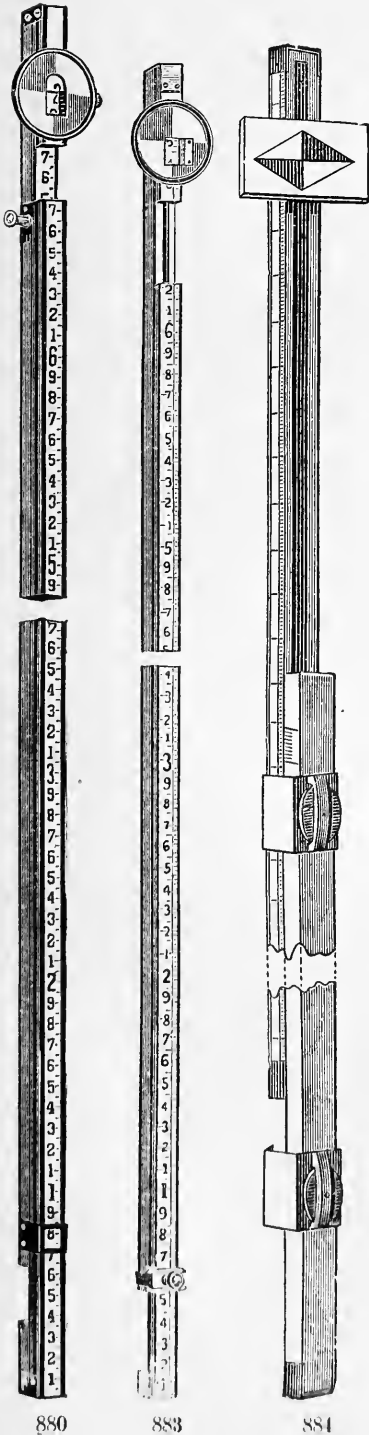
MEASURING CHAINS.

No.		Each.
860.	Steel, W. G. 12, brass handles, brazed links and rings.	
	33 feet	\$5 50
	50 "	6 00
	66 "	9 50
	100 "	10 00
865.	Steel, W. G. 12, brass handles, oval rings, not brazed.	
	33 feet	3 50
	50 "	4 50
	66 "	6 50
	100 "	7 50
870.	Iron, W. G. 8, brass handles, oval rings.	
	33 feet	2 50
	50 "	3 50
	66 "	4 25
	100 "	5 50

ARROWS.

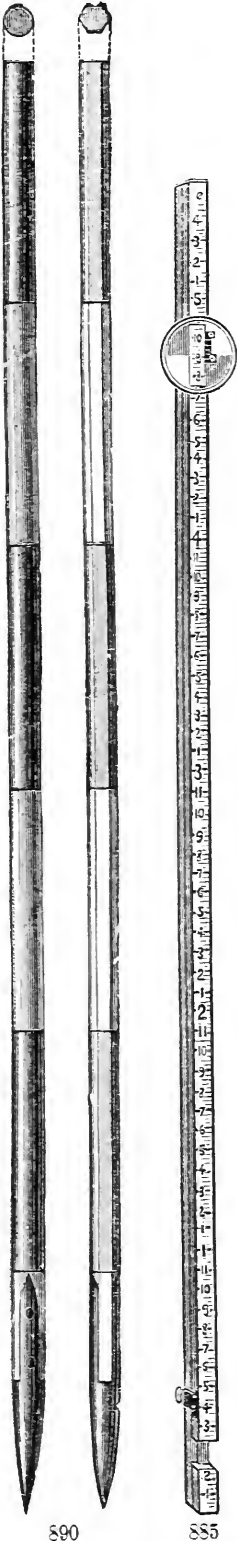
		Per set.
875.	Iron Arrows, W. G. 9, 11 in set, 14 inch	60
876.	Steel Arrows, W. G. 9, 11 in set, 14 inch.....	1 00
877.	" " W. G. 11, 11 in set, 12 inch.....	90
878.	" " W. G. 9, Japanned, 11 in set, 12 inch.....	1 20

LEVELING RODS AND LEVELING POLES.



- | No. | | Each. |
|------|---|---------|
| 880. | Philadelphia Rod , made of hardwood, with target, vernier and clamp, 7 feet, sliding out to 12 feet..... | \$15 00 |
| 881. | Light Philadelphia Rod , made of hardwood, with target, vernier and clamp, 6½ feet, sliding out to 12 feet... | 12 75 |
| 883. | New York Rod , made of hardwood, with target, vernier and clamp, 6½ feet, sliding out to 12 feet | 14 00 |
| 884. | Boston Rod , made of hardwood, with target, vernier at each end, machine divided, 6½ feet, sliding out to 11½ feet | 16 00 |

LEVELING RODS AND LEVELING POLES.



890

885

- | No. | Each. |
|--|--------|
| 885. Architect's Rod, hardwood, with target, vernier and clamp, divided to inches and $\frac{1}{8}$ of an inch, $5\frac{1}{2}$ feet, sliding out to 10 feet..... | \$6 00 |
| 886. Architect's Rod, hardwood, with target, vernier and clamp, divided to 10ths and 100ths of a foot, $5\frac{1}{2}$ feet, sliding out to 10 feet..... | 6 00 |
| 887. Mining Rod, hardwood, with target, vernier and clamp, 5 feet, sliding out to 9 feet | 12 00 |
| 888. Mining Rod, hardwood, with target, vernier and clamp, 3 feet, sliding out to 5 feet | 11 40 |
| 890. Leveling Poles, of best seasoned hardwood, octagonal or circular in cross section, painted red and white alternately every foot. | |
| 5 feet..... | 1 80 |
| 6 " | 2 00 |
| 8 " | 2 25 |
| 10 " | 2 50 |
| 891. Steel Leveling Poles, painted red and white alternately every foot. | |
| 6 feet | 2 50 |
| 8 " | 3 00 |

Metric leveling rods and metric leveling poles furnished to order.

FLEXIBLE LEVELING RODS.



895

No.

Each.

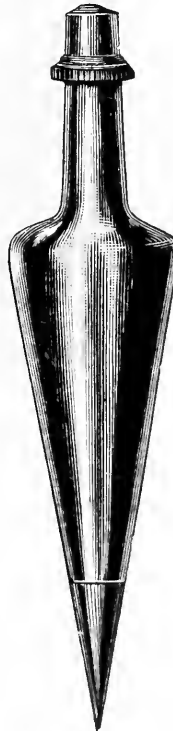
- 895. Pocket Flexible Leveling Rod**, 12 feet long, 3 inches wide, divided to $\frac{1}{10}$ ths and $\frac{1}{100}$ ths of a foot, in tin case..... \$4 00
- 896. The same**, 12 feet long, divided in inches and $\frac{1}{8}$ ths of an inch, in tin case..... 4 00

The flexible rods are a prepared strip of canvas, 3 inches wide, divided like self-reading rod No. 880. It is coiled up in a small roll, and easily carried in the pocket. For use, it is fastened to a straight board with thumb tacks.

PLUMB BOBS.



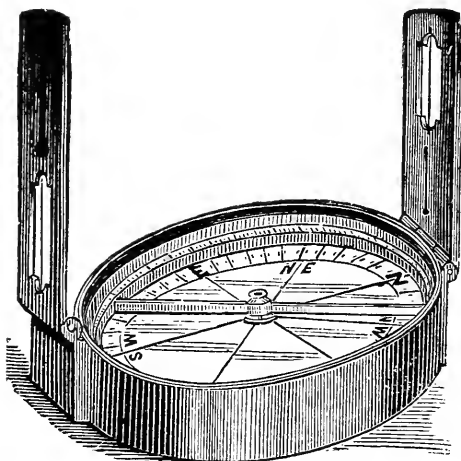
902



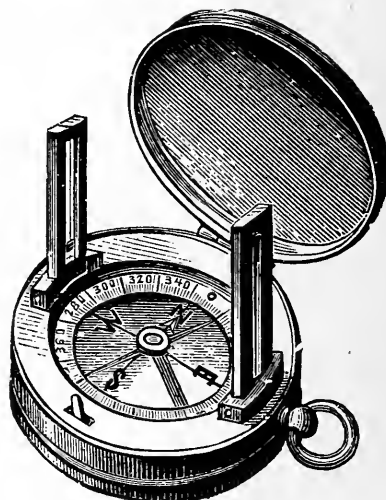
903

- | | | |
|--|---|--------|
| 900. | Plumb Bob , brass, 6 ounce, steel point, screw cap | \$1 50 |
| 901. | " " " 8 " " " | 1 75 |
| 902. | " " " 12 " " " | 2 00 |
| 903. | " " " 14½ " " " with long neck..... | 2 20 |
| 904. | Adjustable Plumb Bob , brass, 10 ounces..... | 2 50 |
| This plumb bob has a concealed reel, around which the string is wound, by turning the milled head on top. The friction upon the reel within will hold it at any desired point of the line. | | |
| Extra large plumb bobs furnished to order at short notice. | | |
| 905. | Plumb Bob Line , braided linen, 10 yards..... | 25 |

MAGNETIC COMPASSES.



921



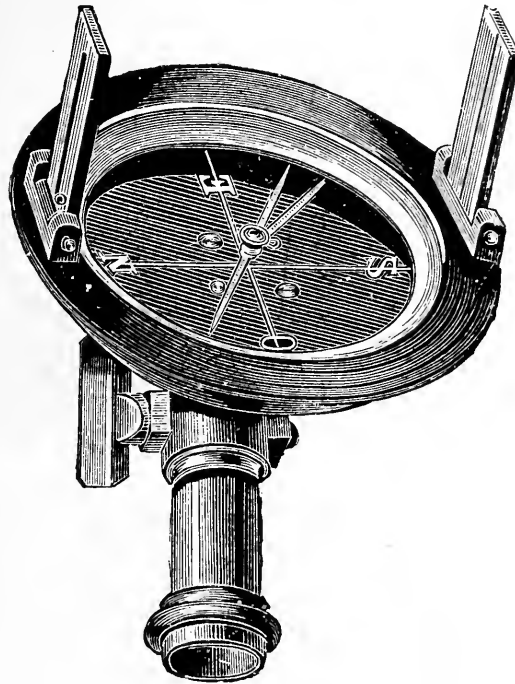
922

No.		Each.
910.	Pocket Compass, watch pattern, brass, 1 inch	\$0 40
911.	" " " " " 1½ "	50
912.	" " " " German silver, agate center, stop to needle, 2 inch	1 20
913.	Pocket Compass, round, brass, with cover, 1½ inch	30
914.	" " " " " 2 "	50
915.	" " " " " and stop to needle, 1½ inch	50
916.	Pocket Compass, round, brass, with cover, and stop to needle, 2 inch	75
917.	Pocket Compass, in square mahogany case, stop to needle, 1¾ inch	1 00
918.	Pocket Compass, round, brass, with cover, agate center, stop to needle, 1½ inch	1 25
919.	Pocket Compass, round, brass, with cover, in round leather case, agate center, edge bar needle, and stop to needle, 2 inch	2 50
921.	Bronzed Pocket Compass, with folding sights, edge bar needle, with cover, best quality, 3 inches	6 25
922.	Nickel Plated Pocket Compass, 2 inch, watch pattern, with folding sights, bar needle, agate center, stop to needle	4 00
923.	Same as No. 922, but 2⅜ inch	4 75
924.	" " 922, but 2¾ "	6 00



SURVEYING COMPASSES.

With Folding Sights. Each Compass in Case.

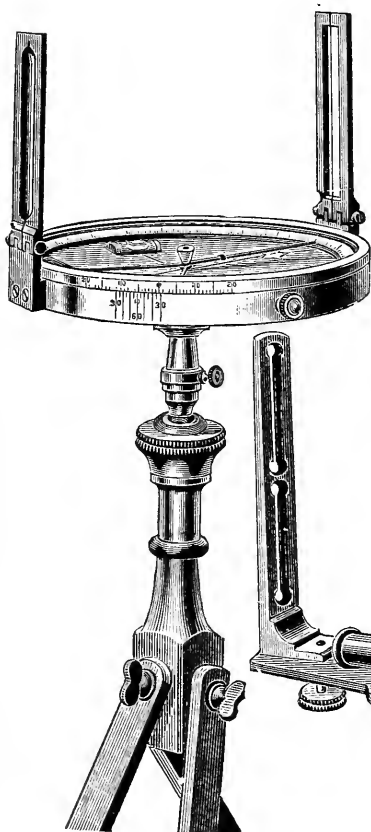


925

No.		Each.
925.	Surveying Compass, with folding sights, ball joint and socket, for Jacob staff mounting, 3 inch needle.....	\$10 00
926.	Surveying Compass, with folding sights, ball joint and socket for Jacob staff mounting, $3\frac{1}{2}$ inch needle	12 00
927.	Surveying Compass, with folding sights, ball joint and socket for Jacob staff mounting, 4 inch needle.....	15 00
928.	Surveying Compass, with folding sights, with 2 bubbles, ball joint and socket for Jacob staff mounting, 3 inch needle	13 00
929.	Surveying Compass, with folding sights, with 2 bubbles, ball joint and socket for Jacob staff mounting, $3\frac{1}{2}$ inch needle	13 50
930.	Surveying Compass, with folding sights, with 2 bubbles, ball joint and socket for Jacob staff mounting, 4 inch needle	15 00
931.	Surveying Compass, with folding sights, 2 inch needle...	6 00
932.	" " " " " $2\frac{1}{2}$ " " ...	8 00
933.	" " " " " 3 " " ...	9 50



SURVEYING COMPASSES.



934



937

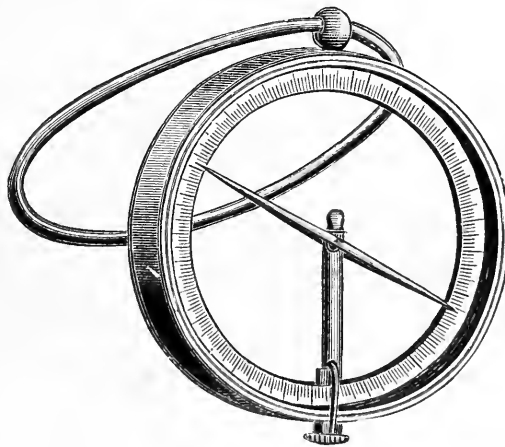
No.		Each.
934.	Surveying Compass, with folding sights, 2 levels, vernier on side of compass box, 3½ inch needle, ball and socket joint for mountings on Jacob staff.....	\$21 00
935.	The same, 4 inch needle.....	23 00
936.	“ 5 “ “	25 00
937.	Surveying Compass, with sights, graduated for taking angles of elevation and depression, 2 levels, 4 inch needle, brass cover, with ball and socket joint for Jacob staff mountings, in mahogany case.....	30 00
938.	The same, 5 inch needle.....	35 00
939.	“ 6 “ “	40 00



SURVEYING COMPASSES.

No.		Each.
940.	Surveying Compass , with sights graduated for taking angles of elevation and depression, two levels, variation plate, 5 inch needle, brass cover, with ball and socket joint for Jacob staff mountings, in mahogany case.....	\$45 00
941.	Jacob Staff , 5 feet, iron point.....	1 00
942.	Tripod for Compasses No. 925 to 930 , and for cross staffs 953 to 956.....	3 00
943.	Tripod for Compasses No. 934 to 940	5 00

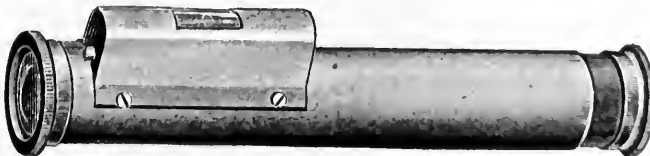
MINERS' COMPASSES.



945

944.	Miner's Compass or Dipping Needle , for tracing iron ore, glass on both sides, brass covers, needle $3\frac{1}{2}$ inch.....	10 00
945.	The same, Norwegian needle, glass both sides, brass covers, needle $3\frac{1}{2}$ inch.....	14 00

HAND LEVELS.

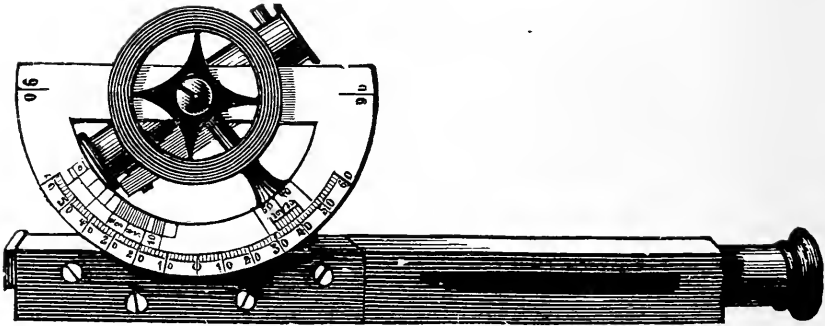


946

946.	Locke's Hand Level , brass, in case.....	6 00
947.	" " " German silver, in case.....	7 50



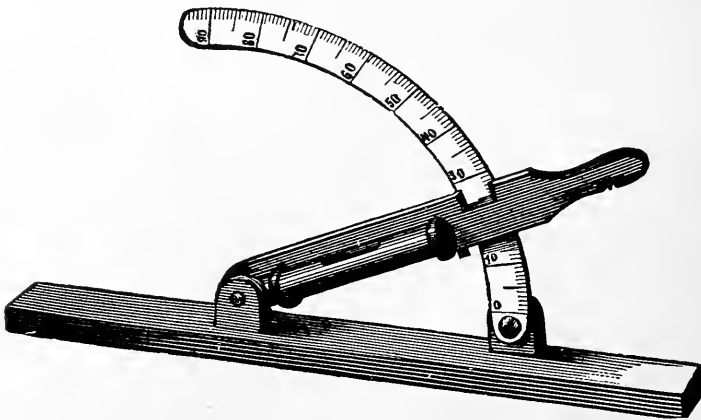
HAND LEVELS.



948

- | No. | | Each. |
|------|--|---------|
| 948. | Abney's Reflecting Level or Pocket Altimeter, improved, with divided arc to show gradients, in morocco case..... | \$13 50 |
| 949. | The same, with compass and socket for Jacob staff..... | 18 00 |

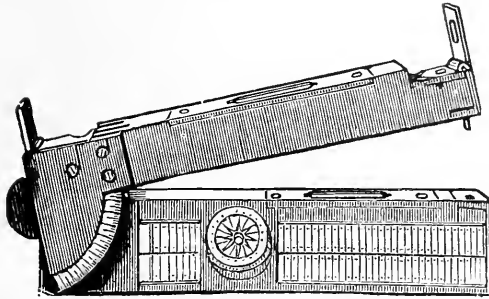
CLINOMETERS.



950

- | | | |
|------|--|-------|
| 950. | Clinometer or Slope Level, of brass, with dividing arc, 9 inches long, folding together, in box..... | 12 00 |
|------|--|-------|

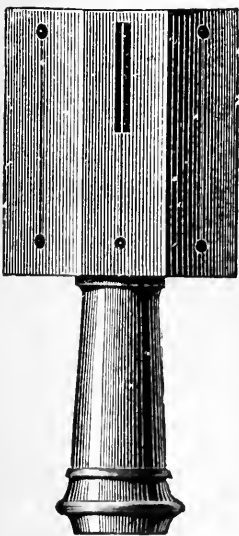
CLINOMETERS.



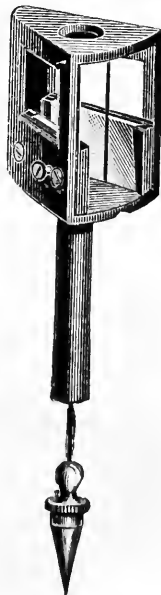
No.		952	Each.
951.	Clinometer, boxwood, jointed, with 2 levels, compass and inclination scale, 6 inch, in leather pocket case.....		\$8 50
952.	Same as No. 951, with sights		11 50

The scale marked in these instruments will give the value of angles, as follows: The angle which has been ascertained from the divided arc on the instrument refers to that degree in the column which is marked angle. In the opposite column will be found the fall or rise in any given distance. For instance, say the degree shown on the divided arc is 10, opposite to this number on the scale is 3, thus indicating 1 part fall or rise in 3, or 1 mile in 3 miles, or 1 foot in 3 feet.

CROSS STAFFS, ANGLE MIRRORS AND PRISMS.



953



957



958

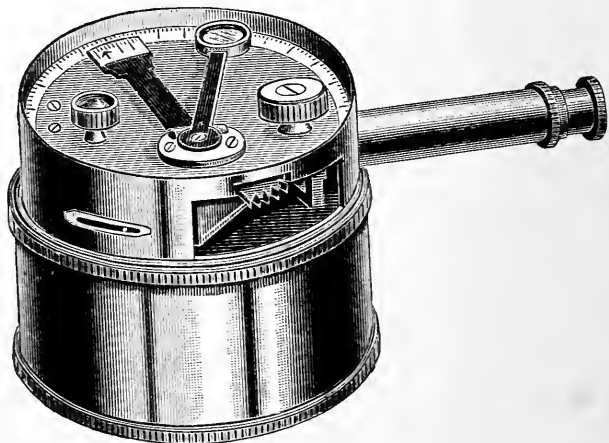
No.									Each.
953.	Cross Staff, head octagonal, in case, for Jacob staff, 2 $\frac{3}{4}$ inch								\$3 00
954.	" " " " " " " 3 "								3 50
955.	" " " " " " " " with mag-								
	netic compass, 3 inch, needle 1 $\frac{3}{4}$ inch								5 00



CROSS STAFFS, ANGLE MIRRORS AND PRISMS.

No.		Each.
956.	Cross Staff , head octagonal, 3 inch, in case, for Jacob staff, with magnetic compass 3 inch, needle $1\frac{3}{4}$ inch, with center axis and divided circle, to take any angle, $3\frac{3}{8}$ in..	\$12 00
957.	Surveyor's Angle Mirror for Right Angles . Instrument furnished with small plumb bob, size, when packed, $3\frac{3}{4} \times 2 \times 1\frac{3}{4}$ inch.....	8 50
958.	Rectangular Prism for Right Angles , $2\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{5}{8}$ in., in morocco case	5 00
959.	Double Prism for taking Angles , 90° and 45° , in morocco case.....	10 00
960.	Reflecting Hand Mirror , for turning right angles.....	7 50

POCKET SEXTANT.



968

968. **Pocket Sextant**, divided on silver, to 30 minutes, vernier reading to 1 minute, with telescope, 2 neutral glasses, reading lens, metal box, diameter $3 \times 1\frac{1}{2}$ inches high, and tangent screw, in leather sling case..... 42 50



SURVEYING INSTRUMENTS.

In the following list of Surveying Instruments we have included the most reliable manufactures. All transits and levels sold by us are of the best workmanship and warranted to be perfect in every respect. The frequent demand for lower priced instruments has induced us, for the first time, to list also transits and Y levels of cheaper construction than those carried by us before. These cheaper instruments are, notwithstanding their lower price, of reliable make, and will give as entire satisfaction in their make, to the engineer and surveyor, as the more expensive and in many ways improved instruments listed in this catalogue. Y levels and transits Nos. 970 to 974 and 981 to 986 represent the more moderate priced, Nos. 975 to 980 and Nos. 987 to 989 B the higher priced instruments, such as we have listed in our former catalogues. All transits listed in this catalogue are provided with a shifting center.

Remarks about Surveying Instruments Listed in this Catalogue.

TRANSITS, OUR NOS. 981 TO 986 INCLUSIVE.

The ten to eleven inch long *telescope* is firmly secured to an axis, the bearings of which are well fitted in the standards, so that the telescope can be turned completely around or be moved in either direction.

The *objective* is an achromatic lens, and is placed at the end of a slide having two bearings, one of these is at the outer end of the tube, the other in a ring suspended within the tube by four screws.

The moving out or in of the objective and eye-piece is effected by pinions, operating in racks attached to their slides.

The *eye-piece* consists of four lenses, forming a compound microscope, the focus of which is in the plane of the cross-wire ring.

Regarding the *magnifying power*, these transits have a power of from twenty to twenty-four diameters in the telescope, sufficient for all ordinary purposes.

The *cross wires* are made of very fine platinum, cemented into the cuts on the surface of a metal ring.

Stadia wires are put in any of these transits, without extra cost, if requested when the instrument is ordered.

The *standards*, having expanded bases, are firmly attached to the upper plate. One of the standards has at the top a little box, actuated by a screw underneath, by which the telescope axis is made truly horizontal.

The *needle* is from three and one-half to six inches long, according to the size of the transit. The needle is about eight one-hundredths of an inch broad, and about three one-hundredths of an inch thick, and the ends brought to a sharp vertical edge.

The *clamp and tangent movement* has its tangent screw with opposing spring attached to the upper plate.



SURVEYING INSTRUMENTS.

The *lower plate* is divided on its upper surface into degrees and half degrees, and figured in two rows, from 0 to 360 and from 0 to 90 each way. The figuring may be differently arranged, according to the wishes of the party ordering the instrument.

The *verniers*, which are double, are attached to the upper plate diametrically opposite to each other. They read to single minutes.

The *graduations* are made on sterling silver. To insure utmost accuracy of graduation the limbs of these transits are polished and the figures engraved before cutting the divisions.

The *sockets* are compound. The interior spindle attached to the vernier plate is turning in an exterior socket when an angle is taken on the limb. When, however, the plates are clamped together, the exterior socket itself, and with it the whole instrument, revolves in the socket of the leveling head.

The instruments have a *shifting centre*.

Y LEVELS, OUR NOS. 971 TO 974 INCLUSIVE.

The *telescope* revolves on two rings, attached near its ends in the Y's. It can be clamped in any position, when the clips of the Y's are brought down upon the rings, by pushing the tapering pins. A rack and pinion movement is attached to the objective as well as to the eye-piece. The telescope has also an adjustment for centering the eye-piece and another one to insure the accurate projection of the objective slide.

The level tube, holding the ground and scaled *level vial*, is furnished at each end with movements in both horizontal and vertical directions. The level scale is graduated to tenths of an inch and figured at every fifth division, counting from zero at the middle of the bridge.

The Y's of these levels are made large and strong. The clips are brought down on the rings of the telescope by the Y pins, which are made tapering so as to clamp the rings firmly.

The *level bar* is made round and shaped for greatest strength in the parts most liable to sudden strains.

The *tangent screw* has the same opposing spring as described in the account of the Engineers' Transits, Nos. 981 to 986.

TRANSITS, OUR NOS. 987 TO 989B.

These instruments have *longer outer and inner centers* than are made in the usual style. These longer centers will give to the instrument more stability and allow the center of gravity to be brought down to the tripod head as closely as possible.

The construction of the *leveling arms* is such that should any of them be strained or bent by the leveling screws, the center would not be injured in any way.

By applying the improved *clamps*, the instrument can be clamped firmly and without injury to any part. To each clamp is attached a micro-meter tangent screw, so as to make a fine adjustment of the plates.



SURVEYING INSTRUMENTS.

The graduations on the *lower plate* are silvered and preferable to graduations on solid silver, which will tarnish after a short usage.

The position of *the verniers* is at an angle of 45° to the telescope. The verniers are provided with hinged shades. These shades are lined with white material, and by their reflection will assist the engineer in a quicker reading of the graduations.

In the *compass box*, which has a beveled rim, on which there are marked the graduations, the needle, in order to allow a closer reading, is bent upwards.

For *setting off the variation* of the needle, the compass ring is partially revolved by means of a rack and pinion. A graduated arc on the bottom plate of the compass box, and a vernier on the vertical part of the compass ring, serve to determine the accurate setting off of the variation.

To insure the telescope being steady and not liable to vibration, the *standards* are bent in conical shape, their feet being placed closely to the compass box where the top plate is most substantial and strongest.

The very best quality of optical glass is used for the *telescope* lenses. A rack movement with compensating spring serves as a contrivance to focus the objective. The focusing of the ocular is effected by a patent lever, by the positive action of same very fine adjusting is secured.

In the telescopes of these transits the *magnifying power* is always in conformity with the use for which the instrument is intended and the grade of the instrument generally.

To prevent damage to the graduations, the *vertical limb*, which is divided on its surface, is not graduated closely up to the edge. The vernier is beveled and hinged, can be lifted off the graduations, and therefore will not scratch the same while the telescope is being adjusted.

LEVELS, OUR NOS. 978 TO 980 INCLUSIVE,

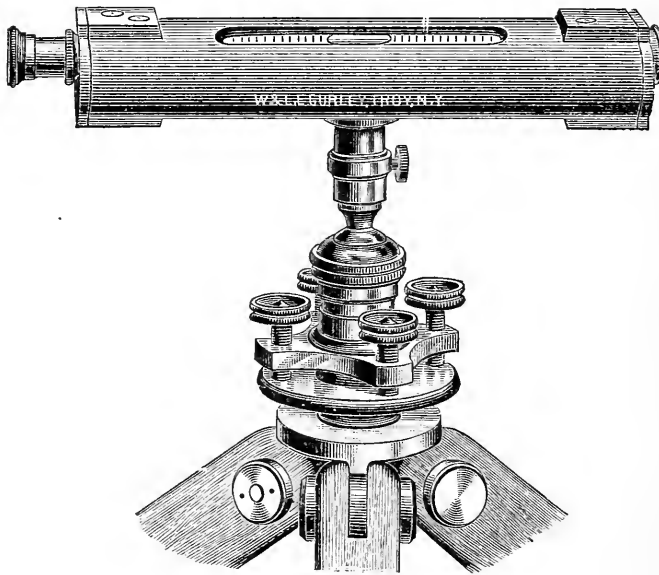
have object rack and motion like transits Nos. 987 to 989B, as described before. The levels have long, well ground and graduated bubbles, which are very sensitive. The strong Y's are provided with patented lever clamps. The bars are of strong construction and wider and deeper in the middle than they are towards the Y's. Long centers, German silver tangent and clamp screw, attached to the bar and revolving with same, are special features of these Y levels.

REPAIRS OF INSTRUMENTS.

We are prepared to repair surveying instruments of all kinds, and guarantee good work and prompt service, at reasonable prices.

Instruments sent to us from parties out of the city, should be packed in their own boxes, and then enclosed in another box, carefully filled with fine shavings.

LEVELS.



970

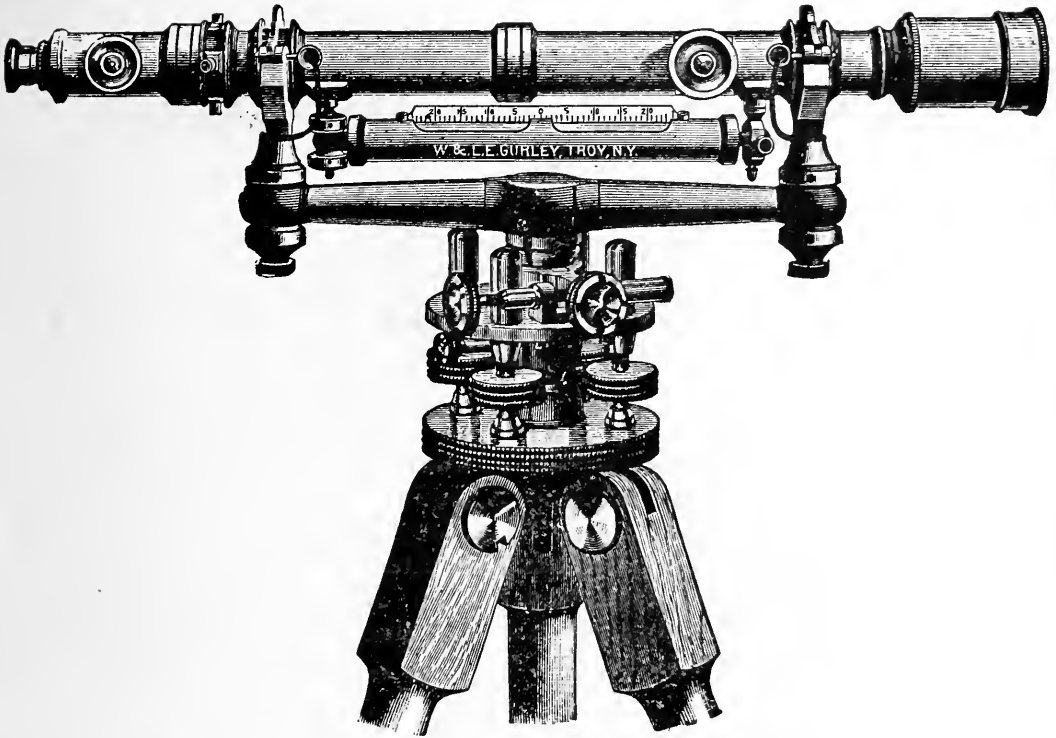
No.	Each.
970. Farmer's or Drainage Level, with tripod, complete.....	\$25 00

The figure represents a level combining the extremes of simplicity and compactness with real efficiency, and all at a very moderate cost. The telescope is about nine inches long and is made especially for this instrument, achromatic, of low but sufficient power, and good light and definition. The cross-wires are fixed in the eye-piece so that they are not easily disturbed. The level and telescope are both enclosed and secured in a strong outside case of bronze from eight to nine inches long, two inches wide, and one and one-quarter inches high, oval in form.

A small socket screws into the under side of the case, and is fitted to a ball spindle, by which it is made approximately level, and then precisely so by the small leveling screws, as shown. When desired the leveling head can be dispensed with, and the instrument leveled on the ball alone.

The advantage of the level in the work of the farmer, manufacturer and builder will be apparent on a simple inspection; drains can be located and leveled, the height of springs ascertained, the accurate levels of lines of shafting, floor timbers, sills, etc., be determined.

LEVELS.

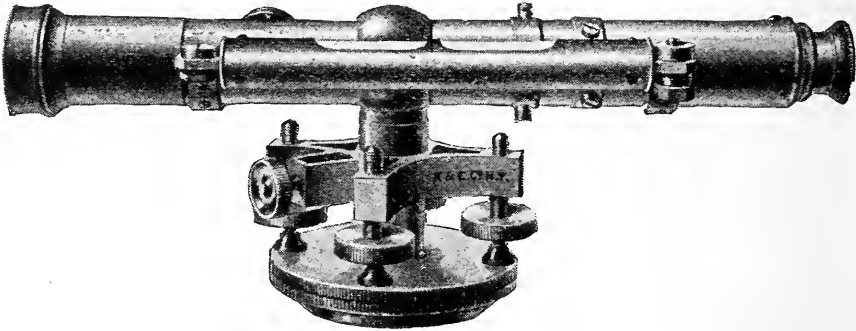


971

No.		Each.
971.	Engineer's Y Level, 15 inch telescope, in box, with tripod, complete.....	\$90 00
972.	Engineer's Y Level, 18 inch telescope, in box, with tripod, complete.....	110 00
973.	Engineer's Y Level, 20 inch telescope, in box, with tripod, complete.....	110 00
974.	Engineer's Y Level, 22 inch telescope, in box, with tripod, complete.....	115 00

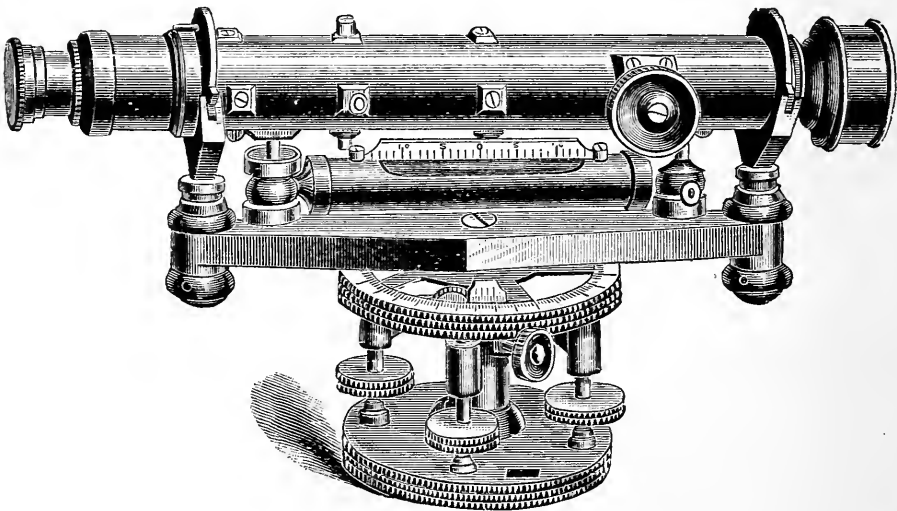
In Levels Nos. 971 to 974 the telescope is made to revolve readily and truly in the Y's by rings of bell metal, which, when desired, may be firmly clamped by the clips and held in any position. One Y clip is furnished with a horizontal stud fitting into a semi-cylindric cut on the flange of the ring of the telescope, insuring the accurate position of the horizontal cross-wire. It has a rack and pinion movement to both object and eye-glasses, and adjustment for centering the eye-piece, and another for insuring the accurate projection of the object glass in a straight line. Both of these are completely concealed from observation and disturbance by a thin ring which slides over them. The Y's of these levels are made large and strong, of the best bell metal, and each has two nuts, both being adjustable with the ordinary steel pin. The level bar is made round, of fine bronze, and shaped so as to possess the greatest strength in the parts most subject to sudden strains. The leveling plates are the same as those used with the Engineers' Transit. The tangent movement of the leveling head is made with an opposing spring. Stadia wires are furnished with Y levels Nos. 971 to 974, free of charge, if ordered with the instrument.

LEVELS.



975

- | | | |
|------|--|---------|
| No. | | Each. |
| 975. | <p>American Dumpy Level, for work not requiring greatest accuracy, such as ditching, draining, road leveling, etc. Achromatic telescope 11 inches long, object glass $1\frac{1}{2}$ inch, with rack movement, graduated bubble. Adjustable eye piece to focus cross hairs. Level complete with metal trivet, plumb bob and adjusting pins, in box, and with hardwood tripod.....</p> | \$35 00 |

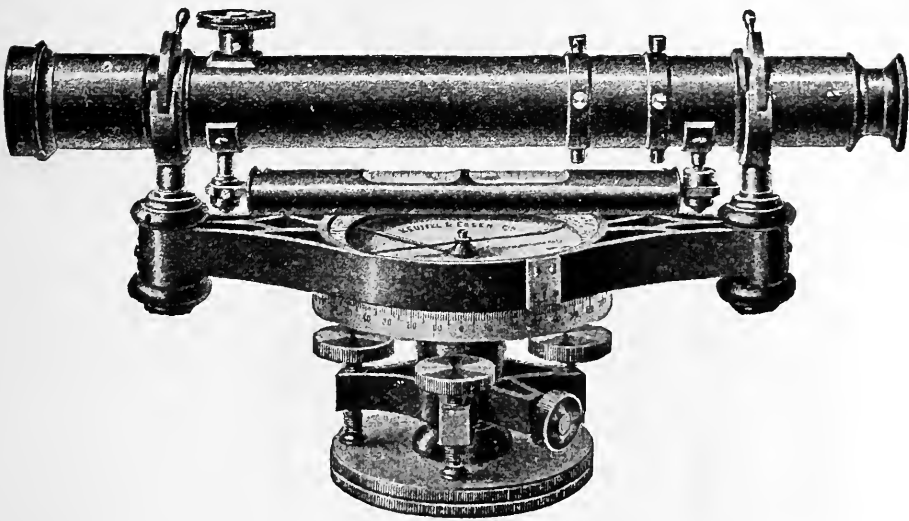


976

- | | | |
|------|--|-------|
| 976. | <p>Architect's or Builder's Y Level, telescope is 11 inches long, has cross hairs and a divided bubble. The horizontal circle is three inches in diameter, and divided to degrees. Has a vernier reading to 5 minutes. Price of instrument in polished box and including plumb bob, adjusting pins and tripod</p> | 45 00 |
|------|--|-------|

LEVELS.

ARCHITECT'S LEVEL, WITH COMPASS.



977

- | No. | | Each. |
|-------------|--|---------|
| 977. | Architect's or Builder's Y Level, telescope 11 inches long, with dust shade and cross hairs, fine divided bubble, object glass with rack movement, eye piece adjustable, compass divided to degrees, fine needle, horizontal circle 3 inch, divided to degrees, with vernier reading to 5 minutes. A most serviceable and compact instrument. Level complete with metal trivet, plumb bob and adjusting pins, in polished mahogany box, and with hardwood tripod..... | \$60 00 |

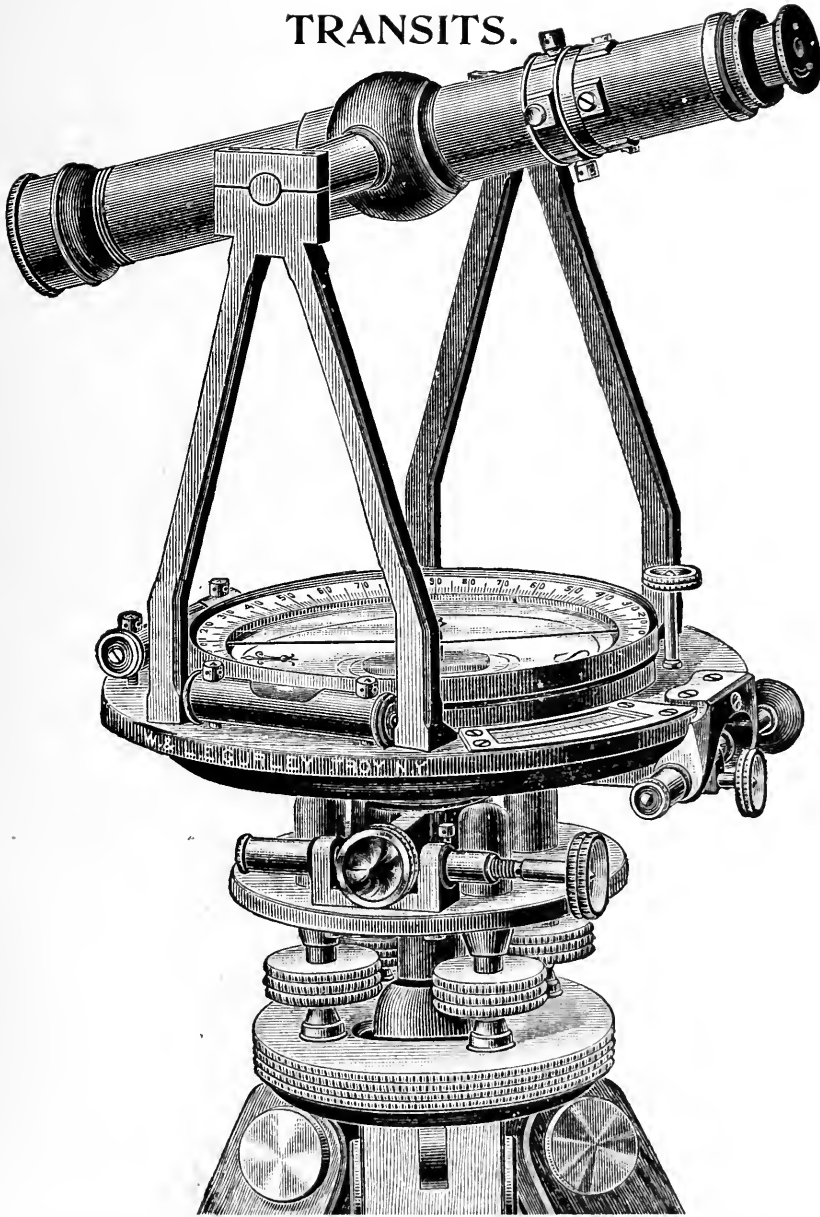
Architects' Levels, when furnished with tangent screw, extra charge \$5.00.

A detailed black and white photograph of a large, vertical mechanical instrument, likely a surveying level or theodolite. The device features a long, cylindrical main body with various adjustment knobs and a large, complex optical assembly at the top. A horizontal beam extends from the side, supporting a smaller cylindrical component. The text "J. T. LITTLE & SONS, LTD., LONDON" is visible on the side of the main body.

Each.

978.	Engineer's Y Level, achromatic terrestrial telescope, 18 inches, dust cap and sun shade, object glass $1\frac{3}{8}$ inch, improved rack movement and eye-piece, with micrometer focusing arrangement, fine sensitive, graduated bubble, adjustable vertically and horizontally; one of the Y's is adjustable for altitude, and has stops for so placing the telescope that cross-wires are horizontal and vertical; clamp and tangent screws are attached to and revolve with the bar. Instrument in fine polished mahogany box, with tripod, complete.....	\$130 00
979.	Engineer's Y Level, the same as No. 978, but telescope 20 inches long, with tripod, complete. 135 00	
980.	" " " " " " " " " " " "	140 00

TRANSITS.

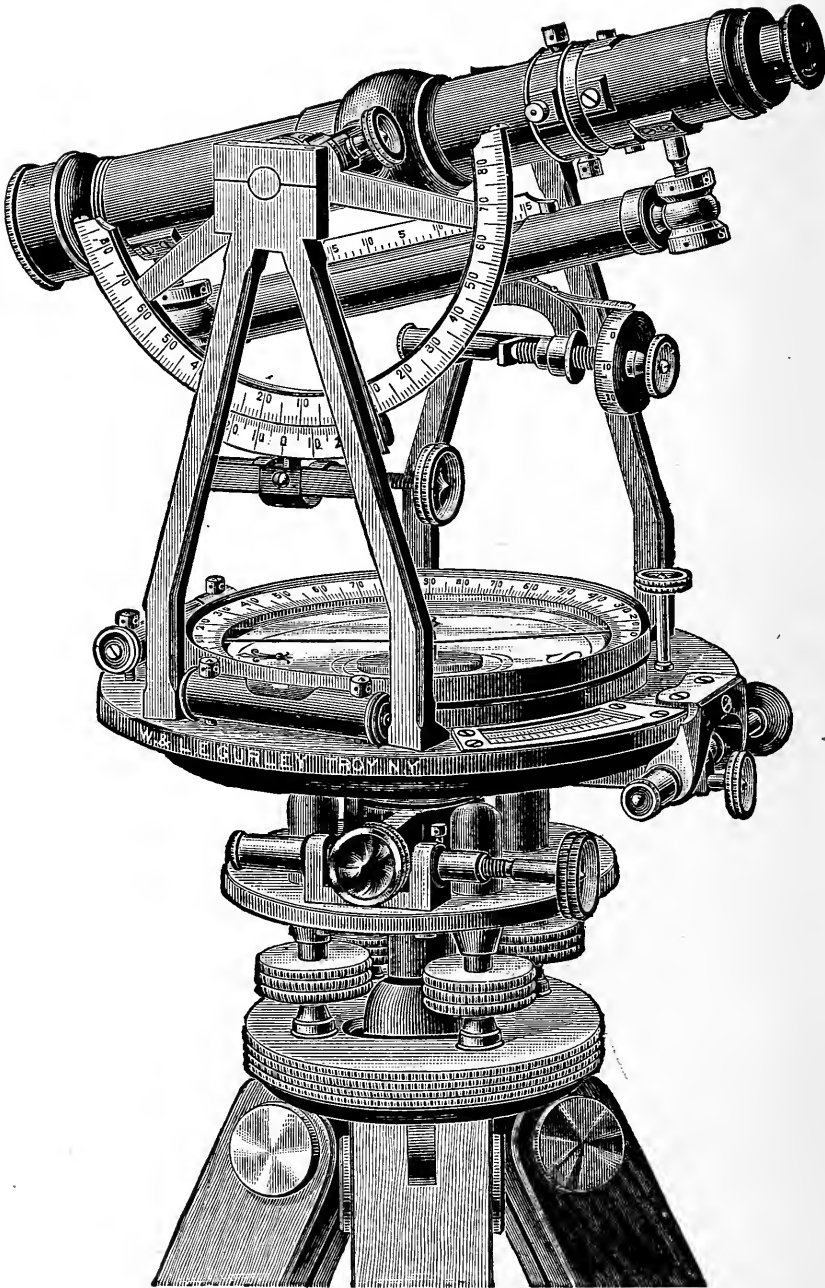


- | No. | 981 | Each. |
|---------------------------------|--|----------|
| 981. Engineer's Transit, | 5 inch needle, two verniers at an angle of 30° with the telescope and thus in front of the observer, so as to be easily read without a change of position. Instrument in box, with tripod, complete | \$150 00 |
| 982. Engineer's Transit, | like No. 981, with level to telescope and clamp and tangent to telescope axis, with tripod, complete | 168 00 |

The sockets are long and the upper parts of the instrument brought down closely to the leveling head, which is itself permanently attached to the centers. The tangent movements have each a single screw with opposing spring and are very sensitive; the clamp to the limb being also attached to the solid center of the instrument instead of the upper plate, as heretofore.

In this Engineer's Transit the compass circle is usually solid with the upper plate; when, however, it is required to set off the variation of the needle, the instrument is made with movable compass circle. Telescope with rack and pinion movements to both eye and object slides. Limbs are graduated on sterling silver. The graduation is to half degrees and is read by vernier to single minutes.

TRANSITS.

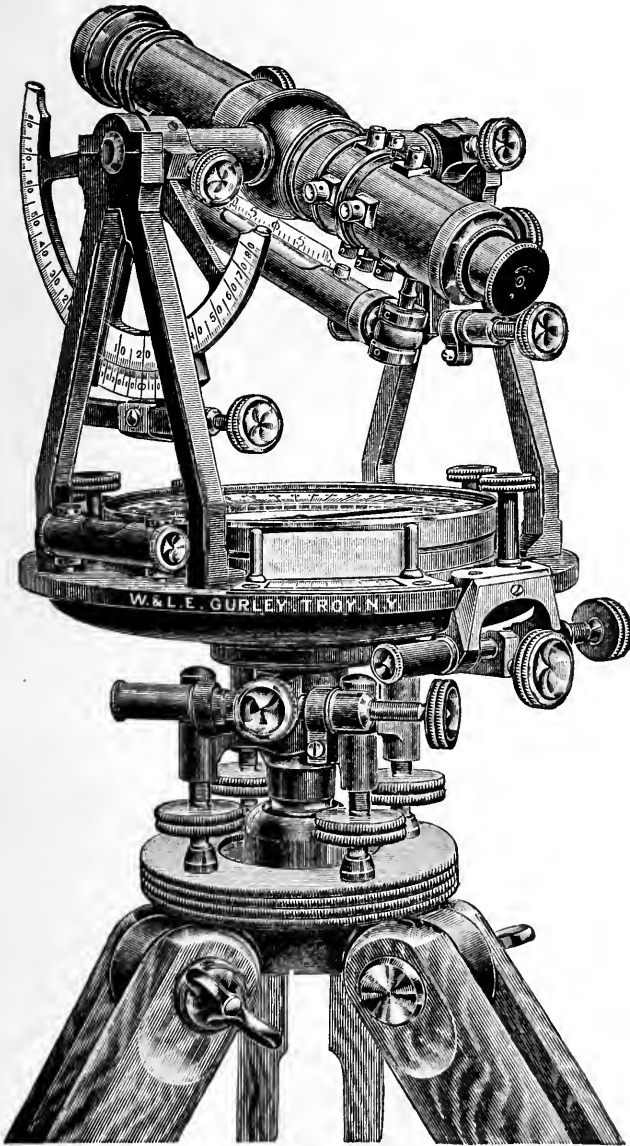


982A.

No. **982A.** Engineer's Transit, two verniers to limb, 5-inch needle, but with 6-inch vertical arc on silver, with vernier moved by tangent screw and reading to 30 seconds, level on telescope, gradienter combined with clamp and tangent. Instrument in box, with tripod, complete.....\$198 00

Each.

LIGHT MOUNTAIN TRANSITS.



Each.

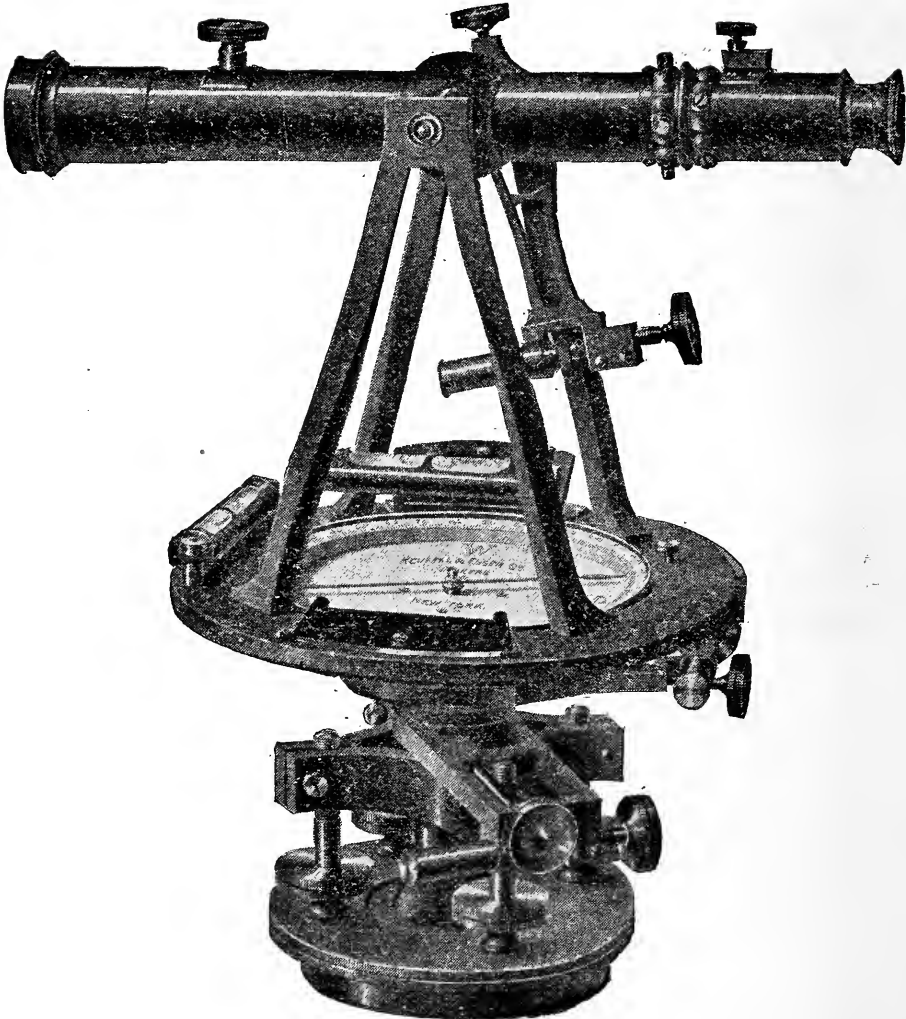
- No. **983. Light Mountain Transit**, 4 inch needle, variation arc, 2 verniers to limb, telescope of finest quality, power twenty diameters, patent extension tripod, shortening to half length. The instrument is packed in a mahogany case, covered with a light sole leather case, with straps for "packing." With plain telescope.....\$150 00

This is an extra light Engineer's Transit for mine or mountain use. It has met with a very large sale and been universally approved. This instrument has all recent improvements in position of verniers, tangent screws, etc., as the Engineer's Transit No. 982A, and when ordered with a solar apparatus it has also new patent latitude level. The horizontal limb, latitude and declination arcs, are read by vernier to one minute, and with the hour circle, are all graduated on sterling silver. The telescope is fitted with stadia wires.

985

- | No. | Each. |
|---|----------|
| 984. Light Mountain Transit , with level on telescope, and clamp and tangent to telescope axis..... | \$168 00 |
| 984A. Light Mountain Transit , with $4\frac{1}{2}$ inch vertical circle, level on telescope, and clamp and tangent to telescope axis | 180 00 |
| 985. Light Mountain Transit , with vertical arc, level on telescope, and clamp and tangent to telescope axis, as shown | 186 00 |
| 986. Light Mountain Transit , with vertical arc, level on telescope, and gradienter combined with clamp and tangent | 198 00 |

TRANSITS.

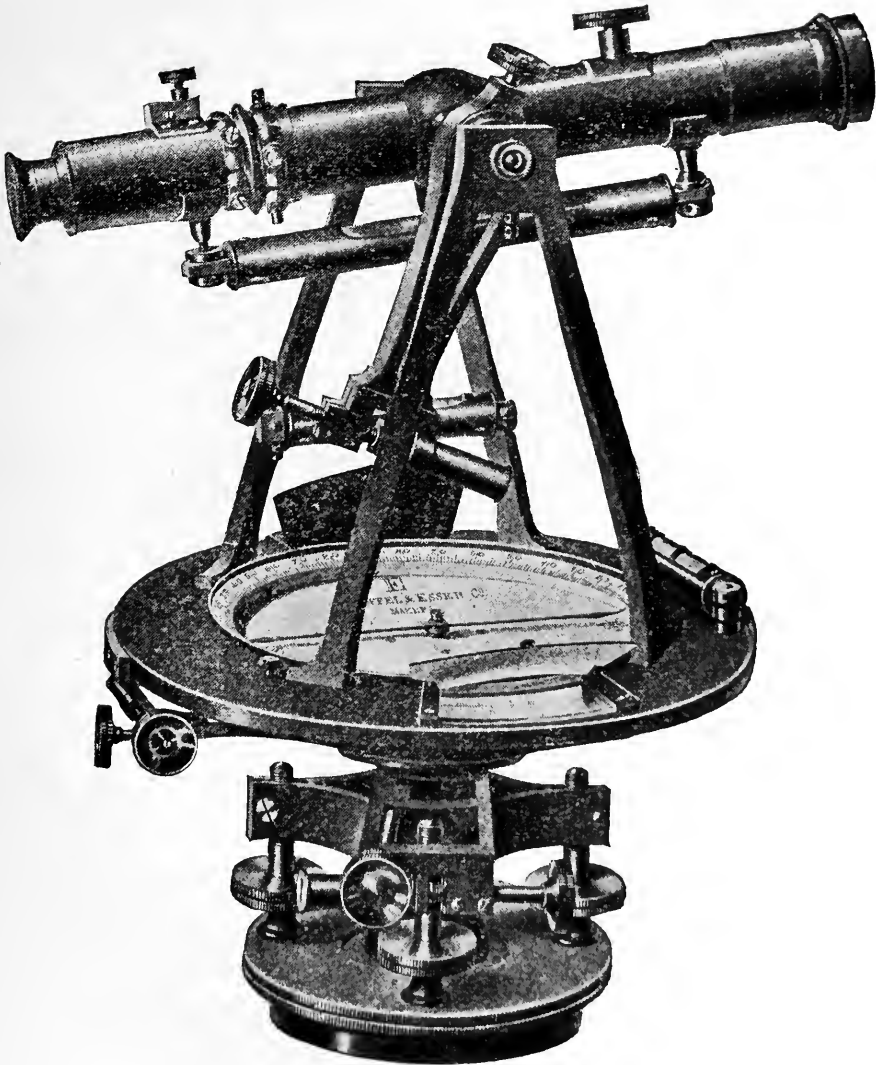


987

- | No. | | Each. |
|--------------|---|----------|
| 987. | Plain Engineer's Transit , achromatic terrestrial telescope 11 inch, dust cap and sun shade, object glass $1\frac{1}{8}$ inch, improved rack movement, eyepiece with micrometer focusing arrangement, adjustable stadia hairs. Needle $4\frac{1}{2}$ inch, horizontal limb 6 inch, graduated to half degrees, two verniers at 45° reading to minutes, with hinged, white lined reflectors. Clamp and tangent screws of German silver, tangent screws with counter spring. Shifting center. Instrument complete, with plumb bob, in fine polished mahogany box and tripod..... | \$185 00 |
| 987A. | Plain Transit , the same as No. 987, but needle 5 inch, horizontal limb $6\frac{1}{2}$ inch, with tripod, complete..... | 190 00 |



TRANSITS.

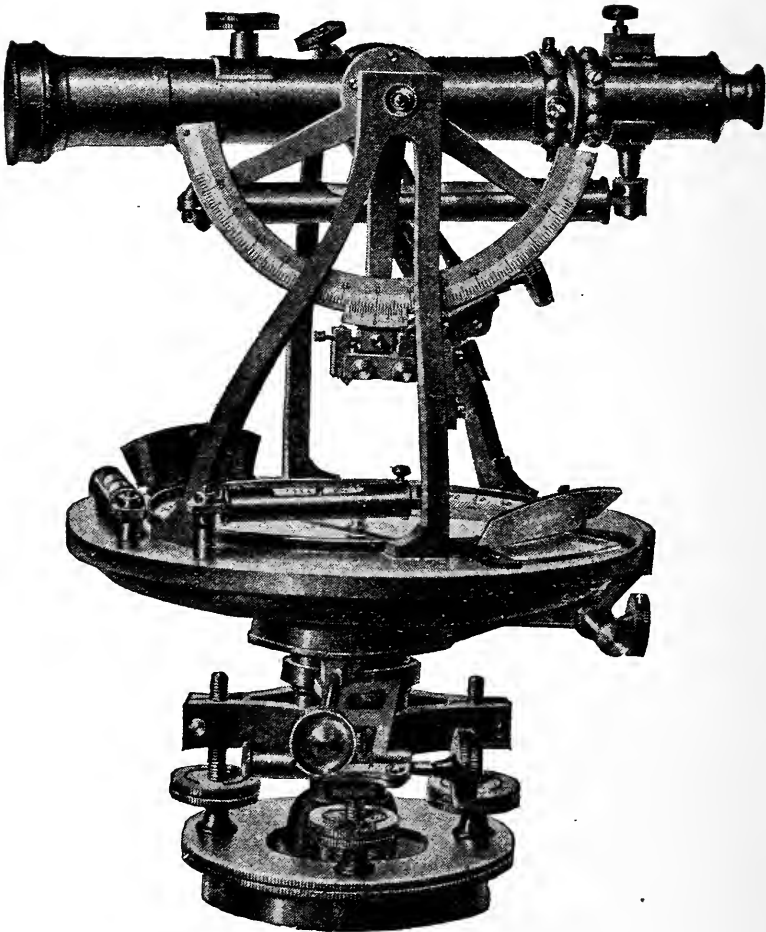


988

No.	Each.
988. Engineer's Transit , like No. 987, with level to telescope, graduated on the glass, clamp and tangent screws with counterspring, needle 5 inch, horizontal limb 6 in. Instrument complete, with plumb bob, in fine polished mahogany box, with tripod.....	\$205 00



TRANSITS.



989

Each.

- | | | | |
|--------------|---|-------|----|
| No. | | | |
| 989. | Engineer's Transit, like No. 988, but with fine bubble to telescope, graduated on the glass, vertical arc 5 inch diameter, graduated on silver, with clamp and tangent screws, with counter spring, needle $4\frac{1}{2}$ inch, horizontal limb 6 inch, verniers at 45° , instrument complete, with plumb bob, in fine polished mahogany box, with tripod.. | \$220 | 00 |
| 989A. | Engineer's Transit, like No. 989, but with fine bubble to telescope, graduated on the glass, vertical limb $4\frac{1}{2}$ inch diameter, graduated on silver, with clamp and tangent screw, with counter spring, needle $4\frac{1}{2}$ inch, horizontal limb 6 inch, verniers at 45° , instrument complete, with tripod..... | 235 | 00 |
| 989B. | Engineer's Transit, like 989A, but needle 5 inch, horizontal limb $6\frac{1}{2}$ inch, vertical limb 5 inch diameter, instrument complete, with tripod..... | 240 | 00 |



TRIPODS, ATTACHMENTS AND EXTRAS,

For Levels and Transits Nos. 971 to 974 and Nos. 981 to 986.

	Each.
Patent Solar Attachment , with declination arc, hour circle and polar axis.....	\$60 00
Level to Telescope , with ground vial and scale.....	12 00
Gradienter , combined with clamp and tangent.....	18 00
Reflector , for illuminating cross-wires.....	4 00
Graduations of Limb , to read 20 or 30 seconds.....	10 00
" " " " to 10 seconds.....	30 00
" " Vertical Circle , to read to 20 or 30 seconds.....	5 00
Vertical Circle , 5½ inches diameter, vernier to 5 minutes.....	8 00
" " 4½ " " " " 1 " 	12 00
" " 5 " " " " 1 " 	15 00
Vertical Arc , 2½ inches diameter, vernier to 1 minute, moved by tangent screw.	18 00
Variation Arc , added to any new transit, if ordered with the transit..	4 00
" " added to transits when sent for repairs.....	15 00
Dust Guard to object slide.....	4 00
Rack and Pinion Movement to eye-piece	5 00
Sights on Telescope , with folding joints.....	8 00
Diagonal Prism for eye-piece of telescope.....	8 00
Quick Leveling Attachment , if ordered with new transit.....	5 00
Plain Tripod , for levels Nos. 971 to 974.	10 00
Split Leg Tripod , for levels Nos. 971 to 974.....	12 00
Extension " " " " 971 to 974.....	15 00
Plain " " transits Nos. 981 to 986.....	10 00
Split Leg " " " " 981 to 986.....	12 00
Extension " " " " 981 to 986.....	15 00



TRIPODS, ATTACHMENTS AND EXTRAS,

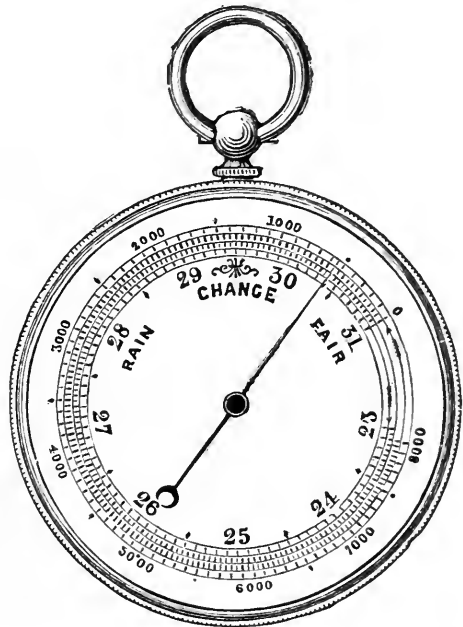
For Levels and Transits Nos. 978 to 980 and Nos. 987 to 989B.

	Each.
Solar Attachment , with prism to eye-piece.....	\$50 00
Level to Telescope	12 00
Gradienter to Telescope	10 00
Improved Sunshade and Reflector	4 00
Graduation on Silver , horizontal limb and verniers.....	10 00
“ “ “ to 20 seconds, horizontal limb.....	10 00
“ “ “ to 10 or 15 seconds, horizontal limb	15 00
“ “ “ to 20 seconds, vertical limb.....	5 00
“ “ “ to 10 or 15 seconds, vertical limb.....	10 00
“ “ “ compass.	5 00
Clamp Screw , for horizontal limb or center.....	75
Tangent “ “ “ “ “	1 50
Leveling Screws	1 50
Compass Needle and Center Pin	2 50
Cover , of rubber cloth, for transit or level	1 00
Fixed Stadia Hairs in telescope.....	2 50
Adjustable Stadia hairs in telescope	5 00
Object Glass	6 00 to 10 00
Eye-piece	6 00 to 8 00
Variation Plate to compass ring.....	5 00
Plain Tripod , for levels and transits Nos. 978 to 980 and Nos. 987 to 989B.....	10 00
Split Tripod , for levels and transits Nos. 978 to 980 and Nos. 987 to 989B.....	12 50
Extension Tripod , for levels and transits Nos. 978 to 980 and Nos. 987 to 989B	15 00



ANEROID BAROMETERS.

For Measuring Heights and Atmospheric Pressure.



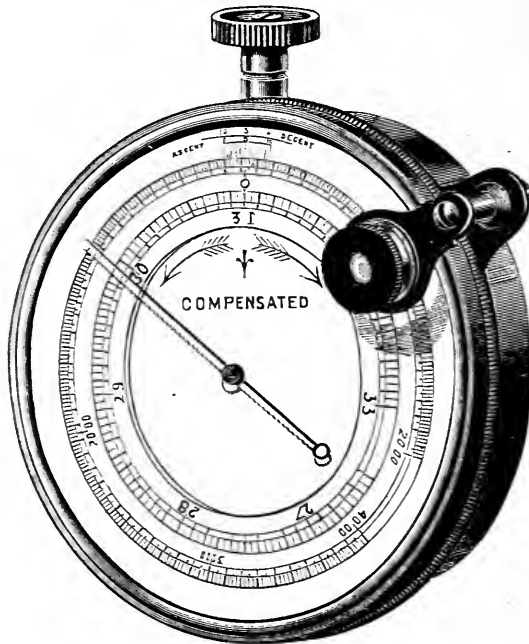
- | No. | | Each. |
|-------|---|---------|
| 990. | Watch size, $1\frac{3}{4}$ inch diameter, gilt case, silvered metal dial, revolving altitude 8,000 feet, in morocco case..... | \$12 00 |
| 991. | Watch size, $1\frac{3}{4}$ inch diameter, gilt case, silvered metal dial, revolving altitude 6,000 feet, compensated for temperature, in morocco case..... | 18 25 |
| 992. | Watch size, $1\frac{3}{4}$ inch diameter, gilt case, silvered metal dial, altitude 18,000 feet, compensated for temperature, in morocco case..... | 20 00 |
| 993. | Watch size, $1\frac{3}{4}$ inch diameter, gilt case, silvered metal dial, raised ring for divisions, altitude 8,000 feet, curved thermometer, large bar-needle compass on reverse (to detach) compensated for temperature, in morocco case..... | 28 75 |
| 994. | Pocket size, $2\frac{1}{2}$ inches diameter, brass case, silvered metal dial, revolving altitude 6,000 feet, compensated for temperature, in morocco case..... | 18 50 |
| 1000. | English government pattern, 5 inch diameter, brass case, best engraved silver dial, raised ring for divisions, curved thermometer, altitude 6,000 feet, revolving index, compensated for temperature, in morocco case..... | 30 00 |
| 1001. | Same as above, but altitude 12,000 feet, in morocco case..... | 33 00 |
| 1002. | Same as above, but altitude 18,000 feet, in morocco case..... | 35 50 |

ANEROID BAROMETERS.

- | No. | | Each. |
|-------|---|---------|
| 1003. | Surveying Barometer, 3 inch diameter, brass case, best engraved silver dial, 14,800 feet, with rack vernier scale, reading to 5 feet, and compensated for temperature, in leather sling case..... | \$47 00 |
| 1004. | Surveying Barometer, 5 inch diameter, brass case, silvered metal dial, raised ring for divisions, altitude 5,000 feet, with rack vernier scale reading to 1 foot, and magnifying lens, in leather sling case..... | 50 00 |
| 1005. | Surveying Barometer, the same as No. 1004, but altitude 14,900 feet, in leather sling case..... | 70 00 |

These instruments, Nos. 1003, 1004 and 1005, have been designed and constructed especially for the use of surveyors and engineers, for the purpose of readily ascertaining slight variations in gradients, levels, etc., and their extreme sensitiveness will be found of considerable utility in mining and surveying work generally.

Besides extreme sensitiveness, the specialty claimed for these instruments is an arrangement of the scale of altitude which admits reading of supervisions by a vernier, hitherto impracticable, owing to the altitude scale in ordinary use being a gradually diminishing one, to which a vernier cannot be applied. In the present instruments the action has been so adjusted as to give accurate readings upon a regular scale of altitudes, the barometrical scale of inches having been made progressive, so as to afford the correct relative readings with the scale of altitudes.



1006

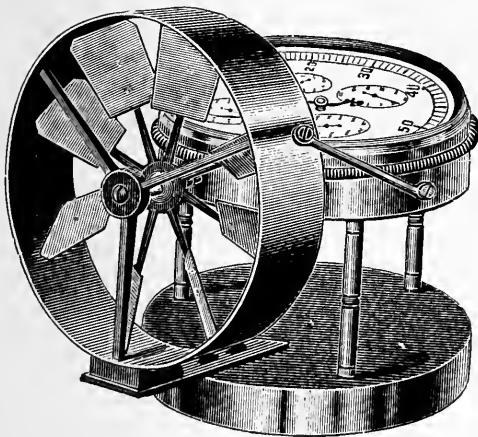
- | No. | | Each. |
|-------|--|---------|
| 1006. | Mining Barometer, 5 inch, silvered metal dial, raised ring for divisions, altitude 2,000 feet below and 3,000 feet above sea level, with rack vernier scale reading to 1 foot, and magnifying lens, in leather sling case..... | \$50 00 |

For mining purposes the entire circle of the dial is graduated to represent 6 inches of the mercurial column, *i. e.*, from 27 inches to 33. This scale will register about 2,000 feet *below* sea level to 4,000 feet *above*; the finest divisions, $\frac{1}{10}$ ths of the altitude scale, represent 10 feet measurements, which can again be subdivided by the vernier scale to *single feet*. The vernier scale is moved by a rack-work adjustment, and a magnifying lens which rotates on the outer circumference of the instrument, facilitates the reading of minute quantities.

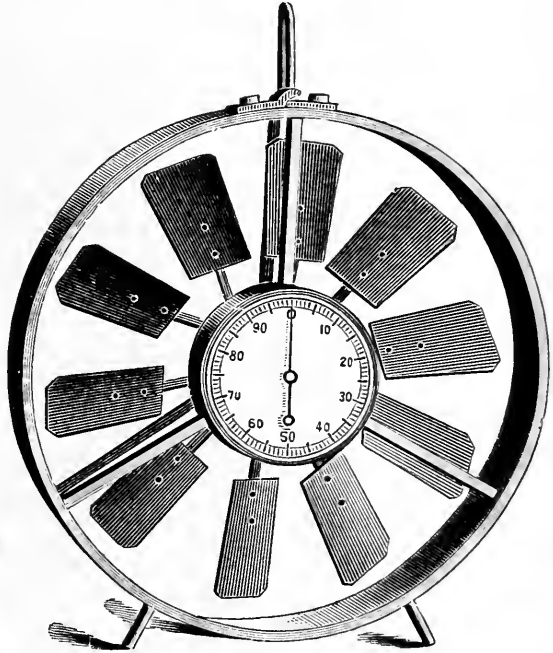
"The Aneroid Barometer," a guide to explain the construction and use of aneroids, with altitude tables, each 50 cents.



ANEMOMETERS OR AIR GAUGES.



1011



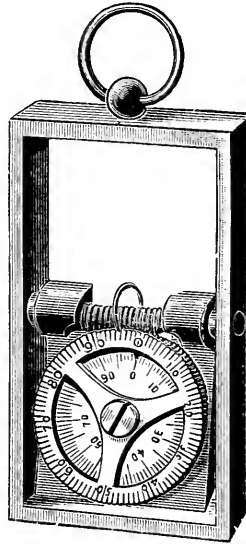
1012

No.	Each.
1010. Improved Anemometer or Air Gauge, registering 1,000 feet, in case.....	\$17 00
1011. Improved Anemometer or Air Gauge, registering 10,000,000 feet	22 50
1012. Biram's Anemometer, 4 inch diameter, recording to 100 feet	17 00
1013. The same as No. 1012, recording to 1,000 feet, with disconnector.....	28 50
1014. The same as No. 1013, but recording to 10,000,000 feet.....	34 50
1015. Biram's Anemometer, 6 inch diameter, 1,000 feet.....	25 50
1016. The same as No. 1015, with disconnector.....	28 00
1017. The same as No. 1016, but recording 10,000,000 feet, with disconnector	35 50

Anemometers are used for measuring the velocity of air currents, in mines, sewers, buildings, hospitals, etc. Each instrument is tested and provided with a table of corrections, to determine the amount of air, in feet, to be added and deducted.



ODOMETERS AND PEDOMETERS.



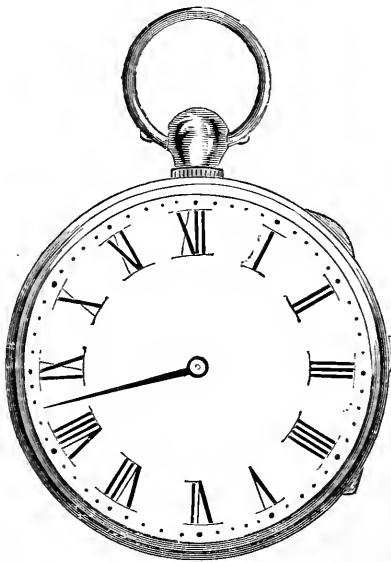
1020

No.

Each.

- 1020. Odometer**, for measuring distances traveled by carriage, in leather case, with strap.....\$15 00

The Odometer is an instrument for ascertaining the number of miles traversed by a carriage or wagon, the revolutions of the wheel being registered, and the miles computed by multiplying the circumference of the wheel by the number of revolutions which the dial indicates.



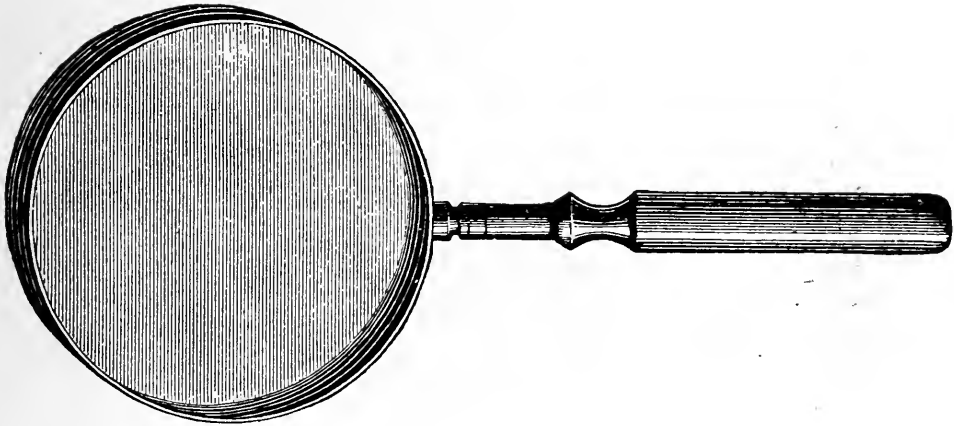
1021

- 1021. Pedometer**, watch pattern, nickel case, registering 12 miles. 4 50
1022. " " " " " " " 100 " 6 00

Pedometers are pocket instruments for measuring the distance traversed in walking, the number of miles being registered by a mechanism, enclosed in a nickel-plated watch casing, and operated by the motion of the body.



READING GLASSES.



1025

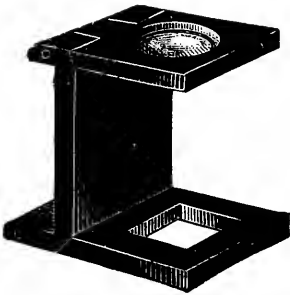
No.		Each.
1025.	Reading Glasses, German silver rim, ebony handle, superior quality.	
1½	inch.....	\$0 50
2	"	65
2½	"	90
3	"	1 10
3½	"	1 50
4	"	2 00
4½	"	2 50
5	"	3 75
5½	"	5 00

DIMINISHING OR REDUCING GLASSES.

1026.	Reducing Glass, plain, 1⅝ inch.....	50
"	" brass mounted, 1⅝ inch.....	75
"	" German silver mounted, 2½ inch, with handle.....	1 50



MAGNIFYING GLASSES.



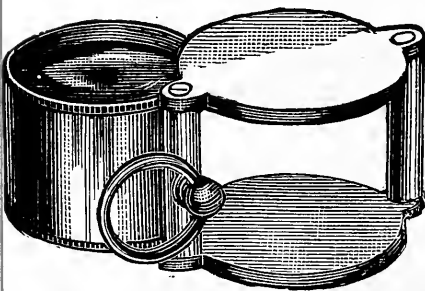
1026A-B



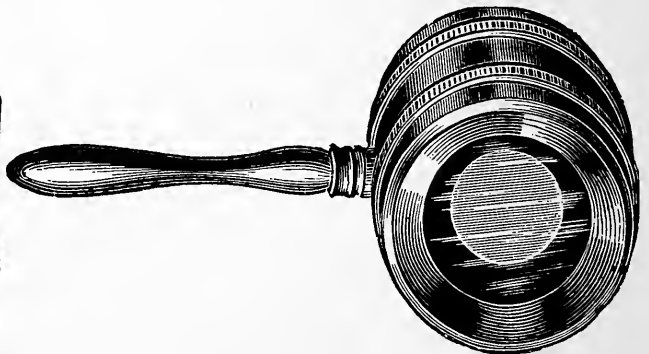
1027A-B

No.		Each.
1026A.	Linen Provers, brass frame, $\frac{1}{4}$ inch field.....	\$0 30
1026B.	“ “ “ “ $\frac{1}{4} \times \frac{1}{2}$ inch field.....	50
1027A.	Magnifier, on 3 legs, $1\frac{1}{2}$ inch brass frame, screw adjustment for focus.....	60
1027B.	Magnifier, on 3 legs, 2 inch brass frame, screw adjustment for focus.....	1 00

POCKET MAGNIFYING GLASSES.



1028A-G



1029A-C

No.		Each.
1028A.	Coddington Lens, nickel mounting, $\frac{3}{8}$ inch.....	0 90
1028B.	“ “ “ “ $\frac{5}{8}$ “	1 00
1028C.	“ “ “ “ $\frac{3}{4}$ “	1 25
1028D.	“ “ “ “ 1 “	1 50
1028E.	“ “ “ “ $1\frac{1}{4}$ “	2 00
1028F.	“ “ “ “ $1\frac{3}{8}$ “	2 50
1028G.	“ “ “ “ $1\frac{1}{2}$ “	3 00



POCKET MAGNIFYING GLASSES.

No.		Each.
1029A.	Pocket Lens, with handle, $\frac{3}{4}$ inch.....	\$1 00
1029B.	“ “ “ “ $1\frac{1}{4}$ “	1 25
1029C.	“ “ “ “ $1\frac{5}{8}$ “	1 50

The Coddington lens is the most powerful form of the simple microscope. It consists of a lens of sharp curvatures on the surfaces, and to obviate the spherical aberration it is cut away hemispherically, leaving but a small central space for the passage of the rays of light; the groove in its edge being filled with black cement.

Oval Pattern, Mounted in Rubber.



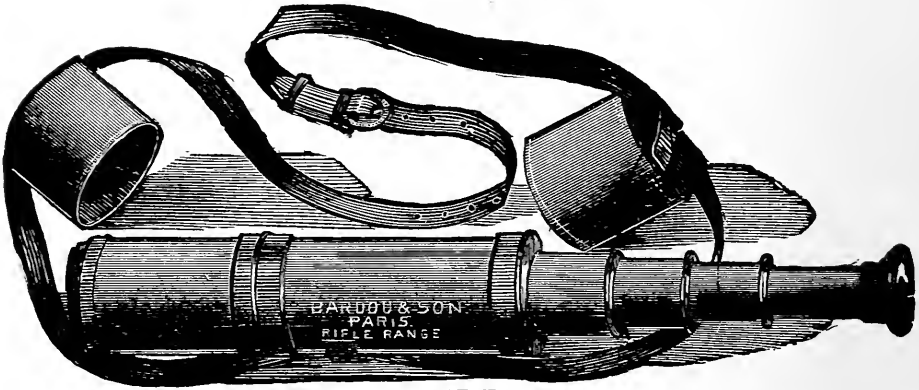
1030



1035

No.		Each.
1030.	With One Lens, 1 inch	35
1031.	“ “ “ $1\frac{1}{4}$ “	50
1032.	“ “ “ $1\frac{1}{2}$ “	55
1033.	“ “ “ $1\frac{3}{4}$ “	75
1034.	“ “ “ 2 “	95
1035.	“ Two “ 1 “	60
1036.	“ “ “ $1\frac{1}{4}$ “	80
1037.	“ “ “ $1\frac{1}{2}$ “	1 00
1038.	“ “ “ $1\frac{3}{4}$ “	1 35
1039.	“ “ “ 2 “	1 75

TELESCOPES—ACHROMATIC.



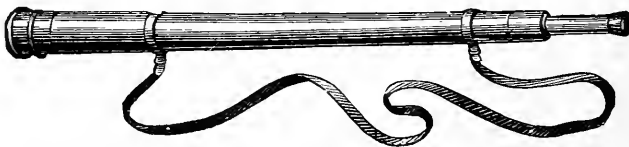
1042D-E

Morocco covered body, polished brass slides and caps, with object glass cap and sliding cover for eye lens.

No.	Length Closed.	Length Drawn Out.	Magnifying Power.	Diameter of Body.	No. of Draws.	Object Glass.	Each.
1042A.	7 in.	18 in.	18 diam.	1 $\frac{3}{8}$ in.	3	14 L.	\$3 25
1042B.	8 $\frac{1}{2}$ "	24 "	24 "	1 $\frac{5}{8}$ "	3	16 L.	4 75
1042C.	10 "	30 "	30 "	1 $\frac{7}{8}$ "	3	19 L.	6 50
1042D.	10 $\frac{1}{2}$ "	36 "	35 "	2 $\frac{3}{8}$ "	4	22 L.	10 25
1042E.	13 "	46 "	45 "	2 $\frac{3}{4}$ "	4	25 L.	27 50

1042E is of superior quality.

1043. Morocco covered body, polished brass slides, with sunshade, brass cap and sliding cover, length, closed, 13 in., drawn out, 48 in., magnifying power 42 diam., body 2 $\frac{1}{2}$ in. diam., 4 draws, object glass 25 L. 18 25
1045. Improved Telescopes, 21 inches long, 4 draw, closing up to 6 $\frac{1}{2}$ inches, object glasses 16 lignes, power 30 times. 11 50
1046. Improved Telescopes, 33 inches long, 4 draw, closing up to 9 inches, object glasses 22 lignes, power 35 times. 22 50



1047

1047. Navy Telescope, bronzed and covered with morocco, taper form, 30 $\frac{1}{2}$ inch, 1 draw, closing up to 24 $\frac{1}{2}$ inch, object glass 22 lignes. 22 00

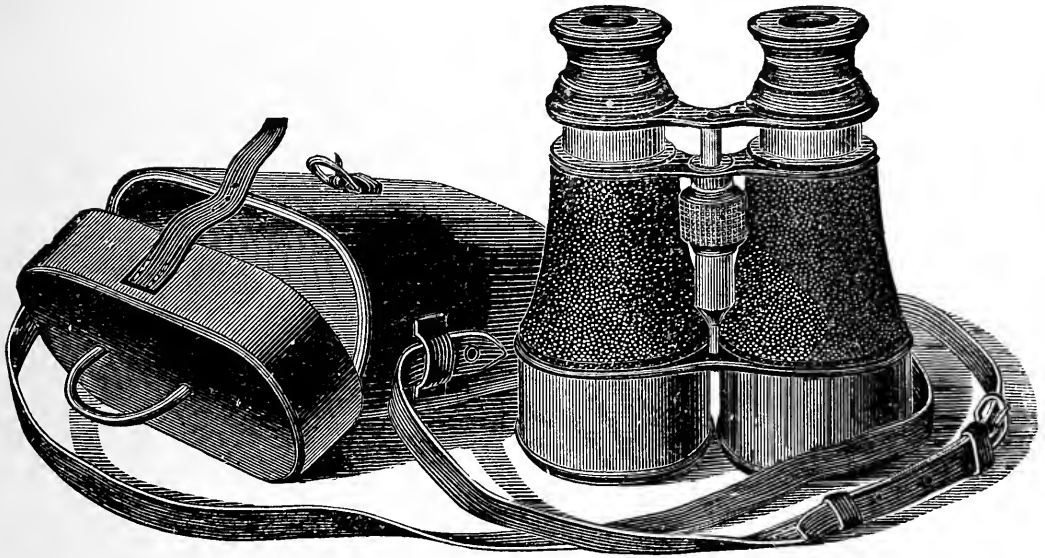
FIELD AND MARINE GLASSES.

1050. With sunshade and plush lined heavy leather case, body covered with smooth leather, stitched on, 19 lignes. 7 50
- 1050A. Same, 26 lignes 10 00



FIELD AND MARINE GLASSES.

Finest and Best.



1051

No.		Each.
1050B.	Superior quality, with sunshade, dead finish, leather lined case with straps, 24 lignes.....	\$14 50
1050C.	United States Signal Service Glass, 26 lignes.....	25 00
1050D.	Field and Marine Glasses, with 3 revolving eye-pieces, by which the magnifying power and field is varied to suit for opera, field or marine. Bronzed and covered with finest morocco, object glasses 21 lignes, in leather case..	23 00
1051.	Field and Marine Glasses, with 3 revolving eye-pieces, as above, bronzed and covered with Turkey morocco, sunshade to extend over object glasses, object glasses 24 lignes, in strong leather case, with straps.....	28 00
1055.	Binocular Telescopes, bronzed and covered with morocco, with jointed body to adjust the distance between the eyes, with sunshade, object glasses 15 lignes, in solid leather sling case. Very powerful; especially adapted for military and naval service.....	45 00

TRIPOD AND CLAMPS FOR TELESCOPES.

Very useful adjuncts to the use of a Telescope.

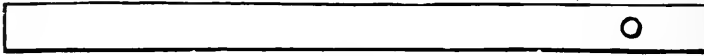
1060.	Wooden Tripod for Telescope.....	6 75
1061.	Clamp	1 50
1062.	"	2 20
1063.	"	3 00

The clamp can be screwed into a tree or post and the telescope held securely in it, affording a steady rest.



WOODEN, HARD RUBBER AND STEEL DRAWING TOOLS.

STRAIGHT EDGES.

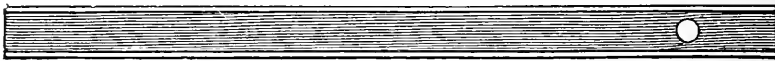


1100

No.

1100. Pearwood, one edge beveled, thick.

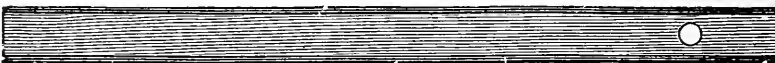
12	15	18	24	30	36	42	inch.
\$0 15	15	20	25	30	40	50	each.



1101

1101. Ash, hardwood lined, square edges, thin.

24	30	36	42	48	54	60	72	inch.
\$0 35	45	55	65	75	1 00	1 40	2 00	each.



1102

1102. Mahogany, ebony lined, square edges, thin.

24	30	36	42	48	54	inch.
\$0 50	60	80	1 00	1 20	1 40	each.



1103

1103. Hard rubber, square edges.

12	15	18	24	30	36	42	inch.
\$0 35	40	50	75	1 00	1 50	2 00	each.

1104. English steel, with one bevel edge, the other square, nickel plated.

12	15	18	24	30	36	42	48	54	60	72	inch.
\$1 50	1 75	2 00	3 00	4 00	4 75	5 50	7 00	8 50	10 00	12 50	each.

BEAM COMPASS BARS.

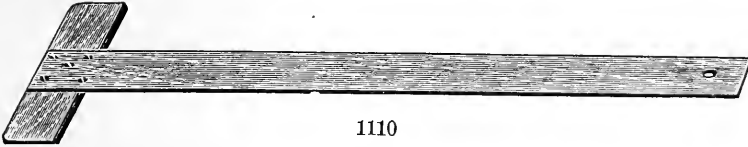


1409

1105. Hardwood bars for beam compasses.

24	30	36	42	48	60	inch.
\$0 25	30	35	40	50	75	each.

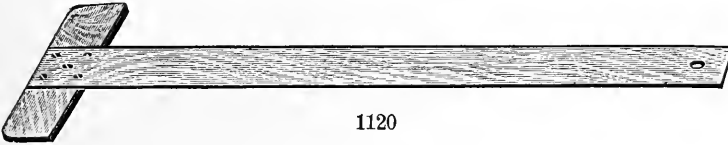
T SQUARES.



1110

No.
1110. Cherry blade, with fixed head.

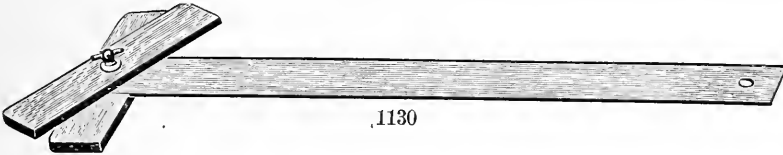
18	24	30	36	inch.
\$0 25	30	40	50	each.



1120

1120. Pearwood blade, with fixed head.

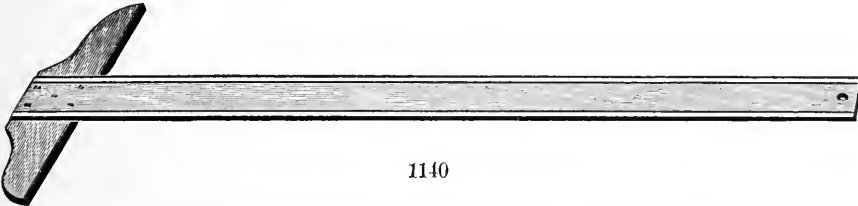
15	18	24	30	36	42	48	inch.
\$0 25	30	40	45	55	65	85	each.



1130

1130. Pearwood blade, with shifting head and swivel.

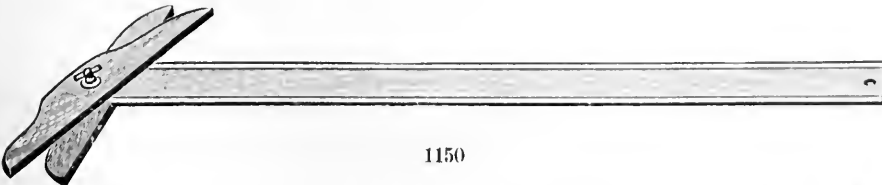
15	18	21	24	30	36	42	48	inch.
\$0 70	75	80	90	1 00	1 15	1 25	1 50	each.



1140

1140. Ash, hardwood lined blade, fine finish, black walnut head, fixed.

24	30	36	42	48	54	60	72	inch.
\$0 60	70	85	1 00	1 20	1 50	2 00	2 50	each.



1150

1150. Ash, hardwood lined blade, fine finish, walnut shifting head, and swivel.

24	30	36	42	48	54	60	72	inch.
\$1 35	1 45	1 60	1 75	2 00	2 25	2 75	3 50	each.



T SQUARES.



1160

No.

1160. Mahogany, ebony lined, fine finish, fixed head.

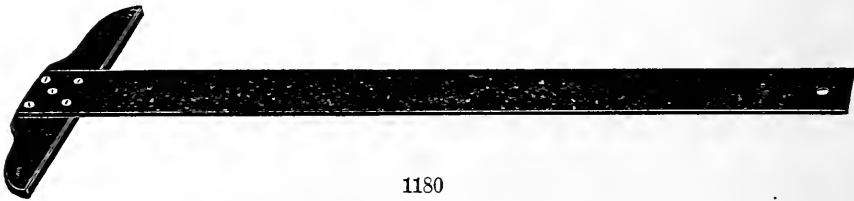
24	30	36	42	48	54 inch.
\$1 00	1 20	1 40	1 60	1 85	2 25 each.



1170

1170. Mahogany, ebony lined, fine finish, shifting head.

24	30	36	42	48	54 inch.
\$1 75	2 00	2 25	2 50	2 80	3 25 each.



1180

1180. Rubber blade, black walnut head, fixed.

6	9	12	15	18	24	30	36 inch.
\$0 40	50	60	75	90	1 25	1 60	2 00 each.



1190

1190. Rubber blade, black walnut head, shifting, with brass swivel.

6	9	12	15	18	24	30	36 inch.
\$0 75	1 00	1 10	1 25	1 60	2 00	2 50	3 00 each.

T SQUARES.

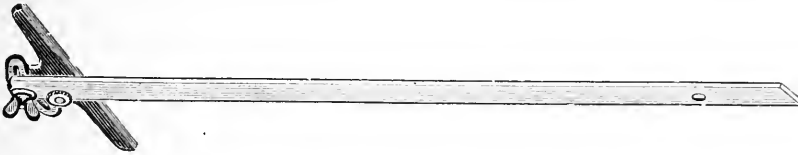


1200

No.

1200. Steel T Square, nickel plated blade, fixed, japanned iron head.

18	24	30	36	42	inch.
\$3 00	3 50	4 50	5 50	7 00	each.



1210

1210. Steel T Square, nickel plated blade, shifting, japanned iron head.

18	24	30	36	42	inch.
\$4 25	5 00	5 75	6 75	8 00	each.



1220

1220. Engraver's T Square, steel blade, fixed brass head

4	6	8	inch.
\$1 00	1 25	1 50	each.

1230. Engraver's T Square, steel blade, shifting brass head.

4	6	8	inch.
\$1 25	1 50	1 75	each.



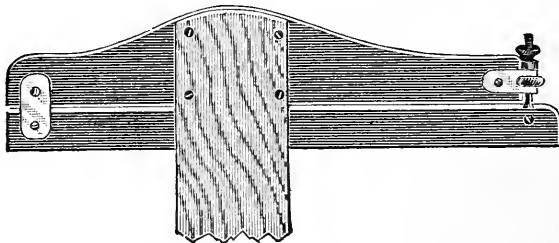
PATENT ADJUSTABLE T SQUARES.

This improvement consists in a patent micrometer adjustment, by which the square can be instantly adjusted to the original lines, which are frequently disturbed by the unavoidable expansion and contraction of drawing papers and cloth. They also can be instantly adjusted so as to conform to lines drawn by any other square or on any other board.

The adjustment is accomplished by loosening the jam or outer nut on the regulating screw and bringing the blade to the desired position with the vernier or inner nut. It is then locked with the jam nut, making the head as rigid as if made of one piece. The inner or bearing head will, if affected by the weather, shrink or expand equally its whole length and remain straight, which the heads of common squares under like conditions cannot do, being rigidly fastened to the head.

The position of the blade is such that, when necessary to work near the lower edge of the drawing board, a bearing of at least one-half the length of the head is retained.

Especial attention is given to the quality of the materials used in this manufacture. They are well made and finished, and are durable, as well as attractive in appearance.

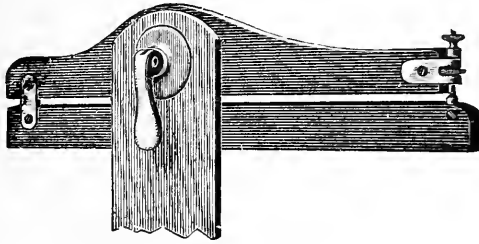


1250

No.
1250. For schools, micrometer adjustment, brass mountings, cherry or maple blades, with cherry heads.

18	24	30	36 inch.
\$1 00	1 15	1 20	1 25 each.

PATENT ADJUSTABLE T SQUARES.

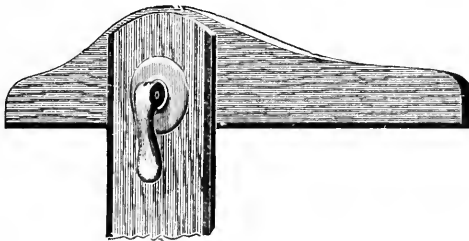


1251

No.

- 1251.** Maple blade with curved walnut head, shellac finish, movable head and micrometer adjustment.

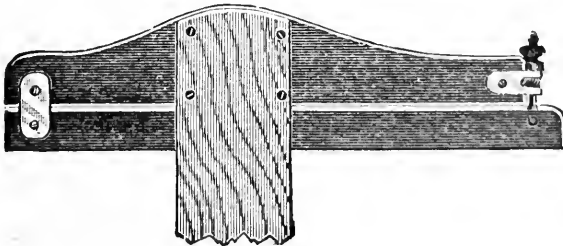
24	30	36	42	48	54	60	inch.
\$2 00	2 10	2 20	2 30	2 50	2 75	3 00	each.



1252

- 1252.** Movable head, maple blade with curved walnut head, shellac finish.

24	30	36	42	48	54	60	inch.
\$1 70	1 80	1 90	2 00	2 25	2 50	2 75	each.



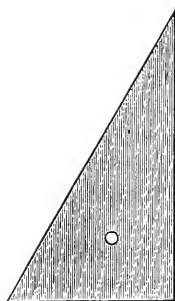
1253

- 1253.** Micrometer adjustment, maple blade with curved walnut head, shellac finish.

24	30	36	42	48	54	60	inch.
\$1 50	1 60	1 70	1 80	2 00	2 25	2 50	each.



WOODEN TRIANGLES.



1300

No

1300. Pearwood, solid, 30x60°.

7

\$0 10



1310

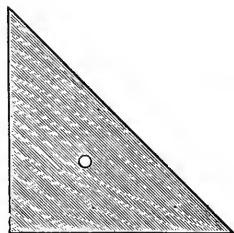
1305. Pearwood, solid, 45°.

6

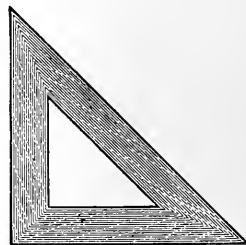
\$0 10

9 inch.

12 each.



1305



1315

1310. Pearwood, framed, 30x60°.

7

9

11

14

17 inch.

\$0 15

20

25

30

40 each.

1315. Pearwood, framed, 45°.

5¾

7½

9

11½

14 inch.

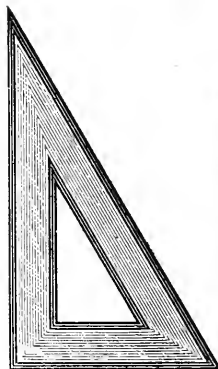
\$0 15

20

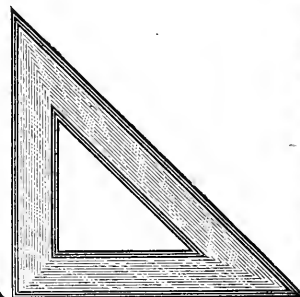
25

30

40 each.



1320



1325

1320. Pearwood lined, 30x60°.

7

9

11

14

17 inch.

\$0 25

30

40

50

75 each.

1325. Pearwood lined, 45°.

5¾

7½

9

11½

14 inch.

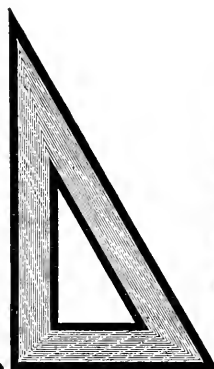
\$0 25

30

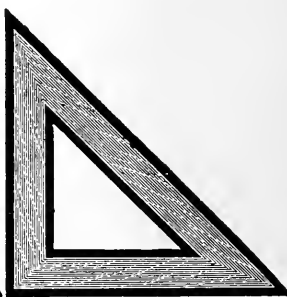
40

50

75 each.



1330



1335

1330. Mahogany, ebony lined, 30x60°.

7

9

11

14

17 inch.

\$0 35

40

55

75

1 20 each.

1335. Mahogany, ebony lined, 45°.

6

7½

9

11½

14 inch.

\$0 35

40

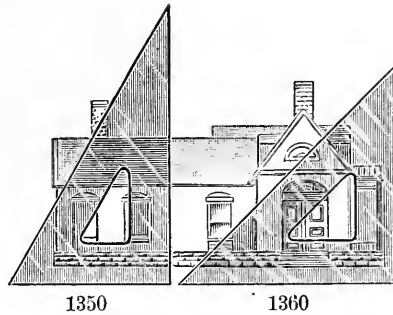
55

75

1 20 each.



TRANSPARENT AMBER TRIANGLES.



No.

1350. Amber Triangles, 30x60°.

4	5	6	7	8	9	10	11	12	13	14	15	16	inch.
\$0 25	35	40	45	55	65	75	85	1.00	1.25	1.60	2.00	2.40	each.

1360. Amber Triangles, 45°.

4	5	6	7	8	9	10	11	12	13	14	15	16	inch.
\$0 35	45	55	65	75	95	1.10	1.35	1.60	1.90	2.20	2.65	3.15	each.

1370. Amber Lettering Triangles, 3½ inch, per set of 3. \$1 75

These triangles are free from most of the faults of other kinds. Being transparent they permit points, lines and figures to be found much more readily than any other kind, and yet have sufficient color to show their form.

They cast a very slight shadow, and show lines plainly as they are being drawn. They can be washed free of ink or stains, and do not "sweat" nor collect greasy dust like rubber, and have been found very satisfactory wherever used. Also they are not liable to be broken, and will not dent or "nick" in use.



RUBBER TRIANGLES.



1400



1410



1420

No.

1400. Hard Rubber Triangles, 30x60°.

4	5	6	7	8	9	10	11	12	13	14	15	16	inch.
\$0 15	20	25	30	35	40	45	55	60	75	1 00	1 25	1 50	each.

1410. Hard Rubber Triangles, 22½x67½°.

4	5	6	7	8	9	10	11	12	13	14	15	16	inch.
\$0 15	20	25	30	35	40	45	55	60	75	1 00	1 25	1 50	each.

1420. Hard Rubber Triangles, 45°.

4	5	6	7	8	9	10	11	12	13	14	15	16	inch.
\$0 25	30	35	40	45	50	60	75	1 00	1 25	1 50	1 75	2 20	each.



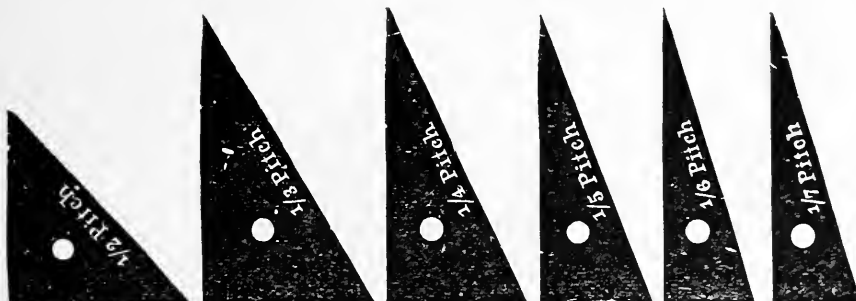
1430



1430. Hard Rubber Lettering Triangles, 3½ inch, per set of 3. \$1 20

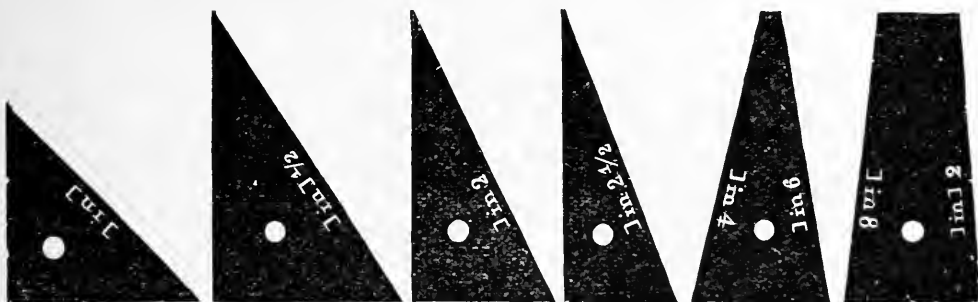


RUBBER TRIANGLES.



1445

- No. **1445.** Hard Rubber Triangles, for roof pitches, 6 in set..... Set. \$2 50



1450

- No. **1450.** Hard Rubber Triangles, for embankments, 8 in set..... Set. 3 75

STEEL TRIANGLES.

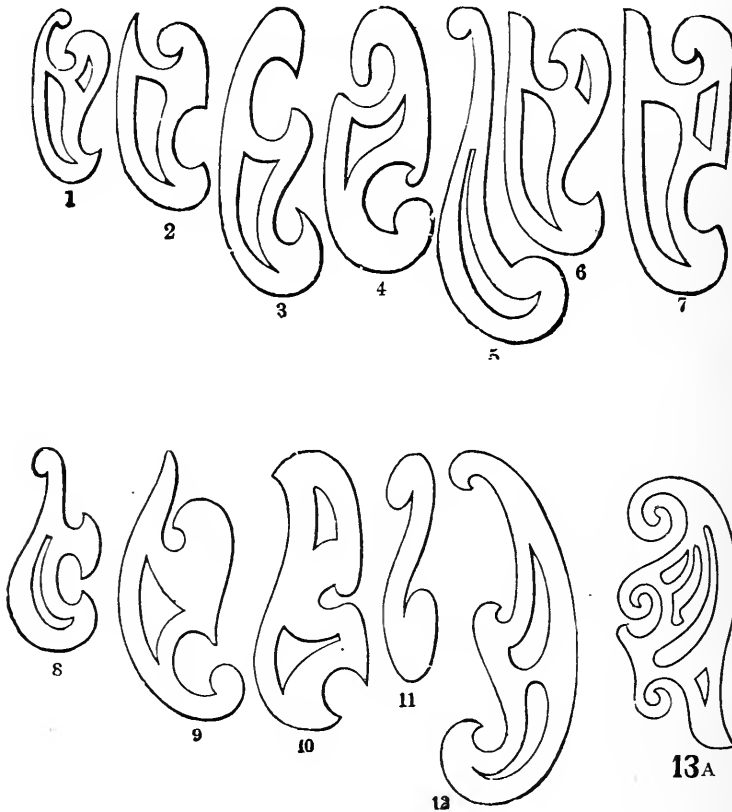
- No. **1460.** Steel Triangles, nickel plated, open center, 30x60°.
- | | | | | | |
|--------|------|------|------|------|-------|
| 6 | 7 | 9 | 10 | 14 | inch. |
| \$3 20 | 3 50 | 3 85 | 4 25 | 6 50 | each. |
- 1470.** Steel Triangles, nickel plated, open center, 45°.
- | | | | | | |
|--------|------|------|------|------|-------|
| 5 | 7 | 8 | 10 | 12 | inch. |
| \$3 20 | 3 50 | 4 25 | 5 50 | 6 50 | each. |

PEARWOOD AND RUBBER ELLIPSES.

- | | | | | | | |
|--------------|-----------------------|------------|---------------------------------|--|--|------|
| No. | | | | | | Set. |
| 1500. | Pearwood Ellipses, | 10 in set, | from 1 1/2 to 6 inches long.... | | | 2 00 |
| 1510. | " | " | 6 " " 2 to 4 1/2 " " | | | 1 25 |
| 1520. | Hard Rubber Ellipses, | 10 in set, | from 1 1/2 to 6 in. long.... | | | 2 00 |
| 1530. | " | " | 6 " " 2 to 4 1/2 " " | | | 1 50 |



PEARWOOD IRREGULAR CURVES.



No.

1550. Pearwood Curves, fine.

No. 1	2	3	4	5	6	7	8	9	10	11	12
\$0 25	30	35	35	35	30	35	25	35	35	25	35 each.

TRANSPARENT AMBER IRREGULAR CURVES.

Same Style as Curves No. 1550.

These curves being transparent amber color, like the Transparent Amber Triangles as described on page 153, possess the same advantages, and particularly allow the portion of the drawing under the curve to be seen in its relation to the line being drawn, thus saving much erasing, time, etc.

1560. Transparent Amber Curves.

No. 1	2	3	4	5	6	7
\$0 45	55	60	60	60	60	60
No. 8	9	10	11	12	13A.	
\$0 45	60	75	40	90	1 20	

NOTE.—Curve No. 13A is made in amber only.



RUBBER IRREGULAR CURVES.



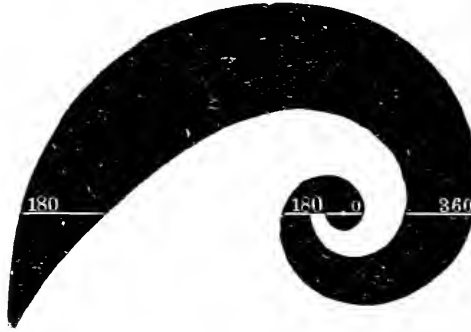
1570

1570. Hard Rubber Curves.

No.	Each.	No.	Each.
1.....	\$0 35	15.....	\$0 45
2.....	35	16.....	35
3.....	50	17.....	35
4.....	50	18.....	40
5.....	40	19.....	50
6.....	35	20.....	50
7.....	30	21.....	45
8.....	25	22.....	35
9.....	25	23.....	40
10.....	20	24.....	60
11.....	20	25.....	40
12.....	30	26.....	35
13.....	50	27.....	75
14.....	35	28.....	2 25



LOGARITHMIC SPIRAL CURVE.



1580

No.		Each.
1580.	Logarithmic Spiral Curve	\$1 50

This excellent curve is so constructed as to contain every curve within its size. The most difficult problems can be solved with the same. Directions accompanying each curve.

ADJUSTABLE CURVE RULERS.



1590

1590.	Adjustable Curve Rule	2 87
-------	-----------------------------	------

This rule is made of very flexible steel, a bar of lead, covered by a spiral spring, being fastened to the steel band. Length of rule 30 inches.

1591.	Extra retaining coils for curve ruler No. 1590	87
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1592.	Adjustable Curve Rule, like No. 1590, but of cheaper construction	1 50
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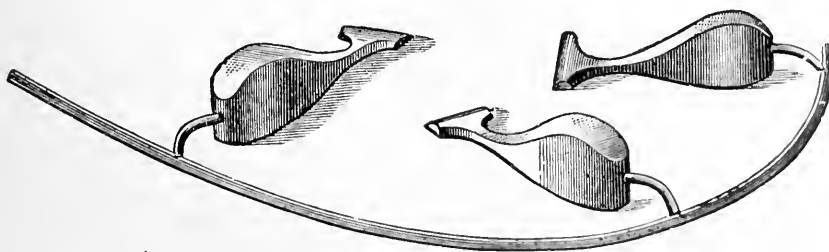
ADJUSTABLE CURVE RULERS.



1593

No.		Each.
1593.	Adjustable Curve Rule	\$1 87
	Made of a bar of flexible rubber, to which is attached a bar of lead, with tempered steel spring. Length of whole rule $14\frac{1}{2}$ inches, of ruling edge 10 inches.	
1594.	Extra leads for curve ruler No. 1593.....	12
1595.	Adjustable Curve Rule, like No. 1593, but of cheaper construction	87

PEARWOOD AND RUBBER SPLINES.



1600-1602

1600.	Pearwood Splines, 12 to 36 inch.....					15 to	40
	These splines are provided with a small groove into which the finger of the weight is laid, in order to prevent slipping of the spline.						
1601.	Hard Rubber Splines.						
	12	18	24	30	36	42 inch.	
	\$0 20	25	25	35	40	45 each.	
1602.	Lead weights for splines						85



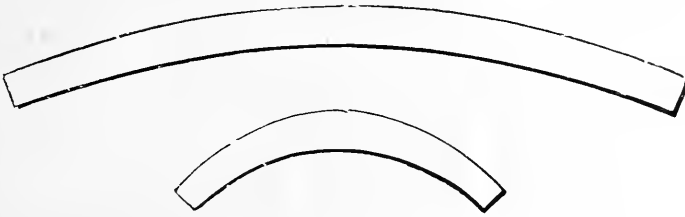
COPENHAGEN HARD RUBBER SHIP CURVES.



1605

No.
1605. Copenhagen Hard Rubber Ship Curves, 45 in set, in
 case, per set.....\$30 00

PEARWOOD AND CARDBOARD RAILROAD CURVES.



1610

- | No. | Per Set. |
|---|----------|
| 1610. Pearwood Railroad Curves, 10 in set, 12 to 120 inch radius, 12, 24, 36, 48, 60, 72, 84, 96, 108 and 120 inch box..... | \$3 50 |
| 1611. Pearwood Railroad Curves, 17 in set, 12 to 50 inch radius, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51, 54, 57 and 60 inch, in box..... | 6 00 |
| 1612. Pearwood Railroad Curves, 25 in set, $1\frac{1}{2}$ to 30 inch radius, $1\frac{1}{2}$, 2, $2\frac{1}{2}$, 3, $3\frac{1}{2}$, 4, $4\frac{1}{2}$, 5, $5\frac{1}{2}$, 6, 7, 8, 9, 10, 11, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, in box..... | 7 25 |
| 1613. Pearwood Railroad Curves, 43 in set, $1\frac{1}{2}$ to 120 inch radius, $1\frac{1}{2}$, 2, $2\frac{1}{2}$, 3, $3\frac{1}{2}$, 4, $4\frac{1}{2}$, 5, $5\frac{1}{2}$, 6, $6\frac{1}{2}$, 7, $7\frac{1}{2}$, 8, $8\frac{1}{2}$, 9, $9\frac{1}{2}$, 10, $10\frac{1}{2}$, 11, $11\frac{1}{2}$, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 110, 120, in box..... | 11 00 |
| 1614. Cardboard Railroad Curves, 25 in set, $1\frac{1}{2}$ to 30 inch radius, $1\frac{1}{2}$, 2, $2\frac{1}{2}$, 3, $3\frac{1}{2}$, 4, $4\frac{1}{2}$, 5, $5\frac{1}{2}$, 6, 7, 8, 9, 10, 11, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, in box..... | 4 75 |
| 1615. Cardboard Railroad Curves, 50 in set, $1\frac{1}{2}$ to 120 inch radius, $1\frac{1}{2}$, 2, $2\frac{1}{2}$, 3, $3\frac{1}{2}$, 4, $4\frac{1}{2}$, 5, $5\frac{1}{2}$, 6, $6\frac{1}{2}$, 7, $7\frac{1}{2}$, 8, $8\frac{1}{2}$, 9, $9\frac{1}{2}$, 10, $10\frac{1}{2}$, 11, $11\frac{1}{2}$, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 110, 120, in box..... | 8 50 |

Single railroad curves of pearwood cut to order.



HARD RUBBER RAILROAD CURVES.



1620

- No. Each.
- 1620. Hard Rubber Railroad Curves**, 10 in a set, viz.: 12, 24, 36, 48, 60, 72, 84, 96, 108, 120 inch radius, in wooden box..... \$6 50
- 1621. Hard Rubber Railroad Curves**, 17 in a set, viz.: 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51, 54, 57, 60 inch radius, in wooden box..... 12 00
- 1622. Hard Rubber Railroad Curves**, 40 in a set, viz.: 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51, 54, 57, 60, 66, 72, 78, 84, 90, 96, 102, 108, 114, 120 inch radius, 1 curve 1° to 100 foot scale, 57.30 inch, 1 curve 2° to 100 foot scale, 28.65 inch, in wooden box..... 25 00
- 1623. Hard Rubber Railroad Curves**, with tangent, 55 in a set, viz.: 3, 3½, 4, 4½, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 30, 32, 34, 35, 36, 38, 40, 45, 50, 55, 60, 65, 70, 75, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200 inch radius, in wooden box..... 40 00
- 1624. Hard Rubber Railroad Curves**, with tangent, marked in degrees and inches to 100 foot scale, 41 in set, viz.:

0° 30' = 114.59 in.	3° 30' = 16.37 in.	6° = 9.55 in.	8° 30' = 6.75 in.
1° = 57.30 "	3° 45' = 15.28 "	6° 15' = 9.17 "	8° 45' = 6.55 "
1° 15' = 45.84 "	4° = 14.33 "	6° 30' = 8.82 "	9° = 6.37 "
1° 30' = 38.20 "	4° 15' = 13.48 "	6° 45' = 8.49 "	9° 15' = 6.20 "
1° 45' = 32.74 "	4° 30' = 12.73 "	7° = 8.19 "	9° 30' = 6.04 "
2° = 28.65 "	4° 45' = 12.07 "	7° 15' = 7.91 "	9° 45' = 5.88 "
2° 15' = 25.47 "	5° = 11.46 "	7° 30' = 7.64 "	10° = 5.74 "
2° 30' = 22.92 "	5° 15' = 10.92 "	7° 45' = 7.40 "	10° 30' = 5.48 "
2° 55' = 20.84 "	5° 30' = 10.42 "	8° = 7.17 "	11° = 5.22 "
3° = 19.10 "	5° 45' = 9.97 "	8° 15' = 6.95 "	11° 30' = 4.99 "
3° 15' = 17.63 "			

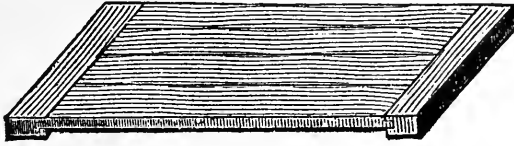
In wooden box, per set 30 00

Single Railroad Curves of hard rubber, with tangent, each... 90

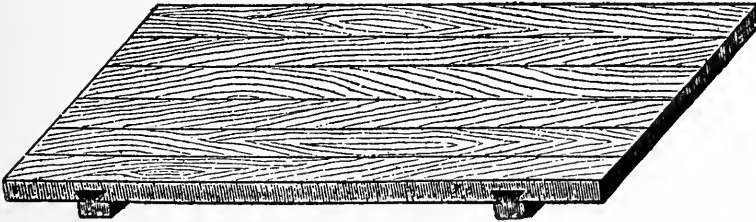
Special sets of Railroad Curves furnished to order.

DRAWING BOARDS.

These boards are made of best seasoned material, narrow pieces of pine wood being carefully jointed.

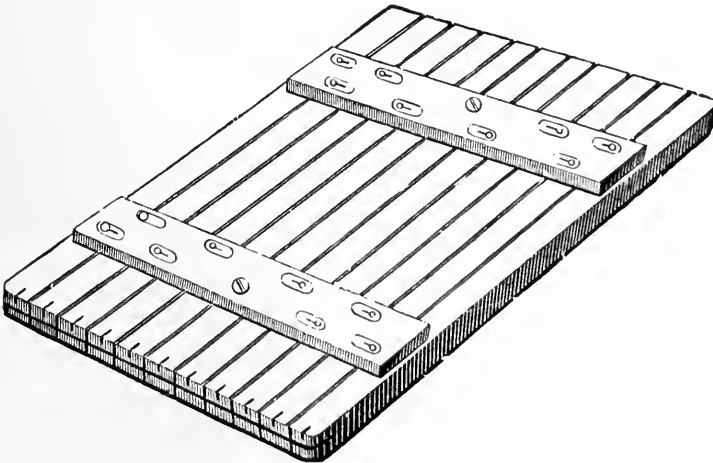


No.	1650				
1650.	Pinewood, clamped ledges.				
	13x17	16x21	18x23	20x25	23x31 inch.
	\$0 60	75	85	90	1 25 each.



	1660					
1660.	Pinewood, hardwood ledges dovetailed into the board.					
	20x25	23x31	27x35	31x42	36x60	42x60 48x72 inch.
	\$1 20	1 80	2 50	3 75	6 00	7 00 12 00 each.

Grooves sunk in half inch thickness of boards 31x42, 36x60, 42x60 and 48x72.



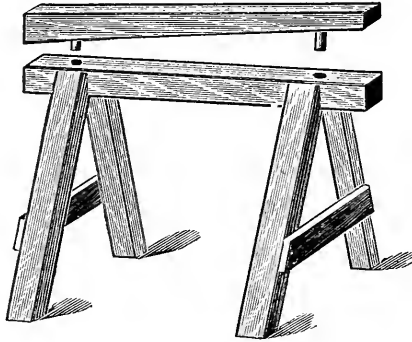
	1670				
1670.	Pinewood, hardwood ledges screwed to the board, grooves sunk in half the thickness of the board, thus strengthening the ledges, to prevent board from warping.				
	16x21	20x25	23x31	28x41	33x55 inch.
	\$2 50	3 20	4 00	6 50	10 00 each.

Extra large drawing boards made to order of well seasoned material and best of workmanship, at short notice.

TRESTLES FOR DRAWING BOARDS.

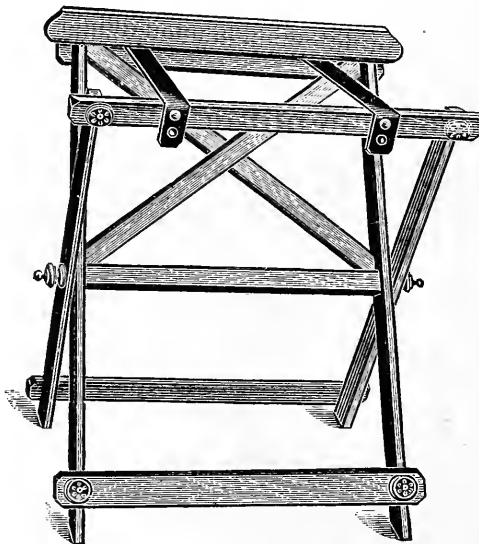
No.

- 1680.** Pinewood Trestles, 36 inch high, 40 inch long, for boards
31x42 or 33x55, per pair..... \$2 75



1681

- 1681.** Pinewood Trestles, 36 inch high, 40 inch long, with sloping
top ledges, per pair..... 5 50



1582

- 1682.** Folding Hardwood Trestle, 37 inch high, 33 inch long,
26½ inch wide, each..... 6 50

DRAWING TABLES.



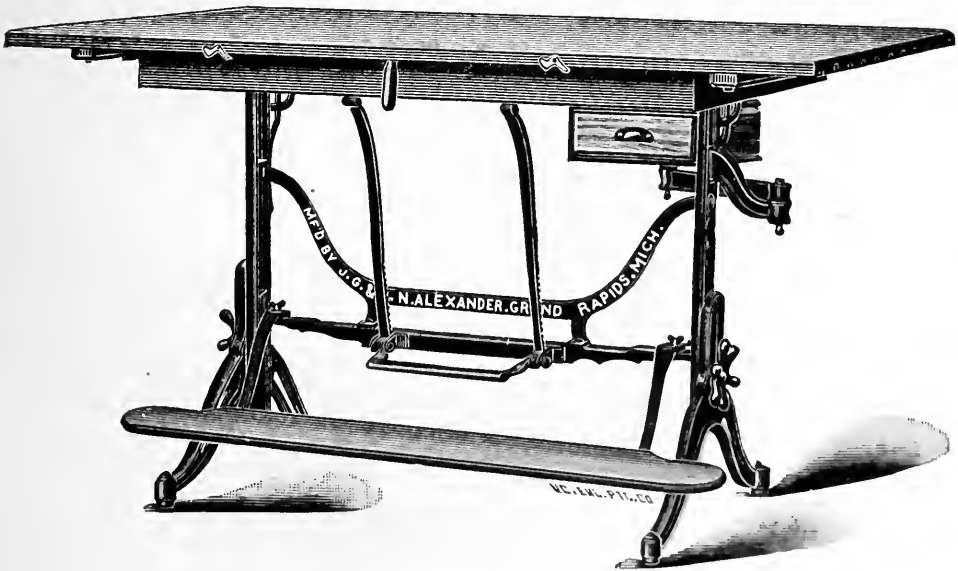
1583

Each.

No.

1683. Folding Trestle, adjustable pine board, 32x42 inch, 38 inch
high

\$6 50



1684

1684. Adjustable Drawing Table, on iron stand, board 37x60
inch.....

\$5 00

Tables Nos. 1684 and 1687 are instantly adjusted to any elevation required, either horizontally or at any angle of inclination; stand firmly in any position; incline in either direction; firmly braced; no set screws; no springs, well made; finely finished. Provided with folding arm, with shelf and drawer for tools, etc. Folds completely when not in use; top is in every respect a perfect drawing board.

DRAWING TABLES.

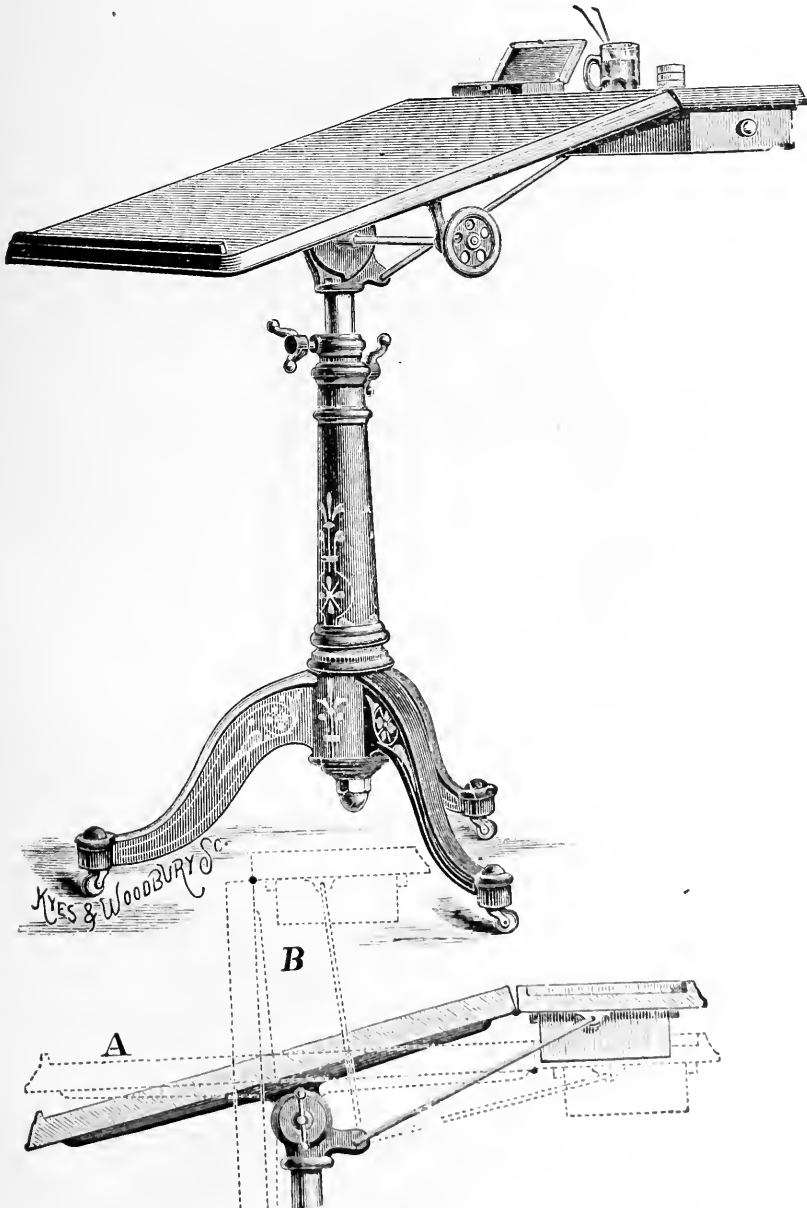


1685 and 1686

- | No. | | Each. |
|--------------|---|---------|
| 1685. | Folding Hardwood Trestle , with drawing board, 37 inch high. The drawing board is made of selected pinewood and hinged to the trestle, on which it can be slanted by means of supports catching in toothplates. Board and trestle fold up compactly. Board 31x42 inch..... | \$10 00 |
| 1686. | Folding Hardwood Trestle , same as above, with board 33x55 inch..... | 13 00 |
| 1687. | Adjustable Drawing Table , on iron stand, board 31x42 inch..... | 25 00 |

AMERICAN DRAWING TABLE.

No.		Each.
1688.	Plain ash board, 21½x24 inch.....	\$ 8 75
1689.	“ “ “ 21½x24 “ with shelf.....	10 00
1690.	Black walnut “ 22x25½ “ “	11 00
1691.	“ “ “ 22x25½ “ “ and drawers.....	13 25

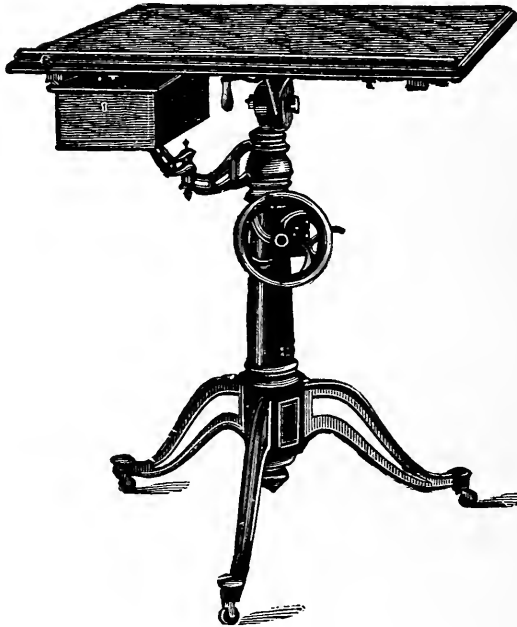


1692

- 1692.** Black walnut board, 22x25½ inch, with shelf, drawers and long set screw, finely ornamented.... 16 50

Tables Nos. 1688 to 1692 can be used either sitting or standing. The top boards are adjustable to any desired angle; serve as drawing table or easel. In the lowest position the tables are 30 inches high, and may be elevated to 44 inches.

ARTISTS' FAVORITE DRAWING TABLE.



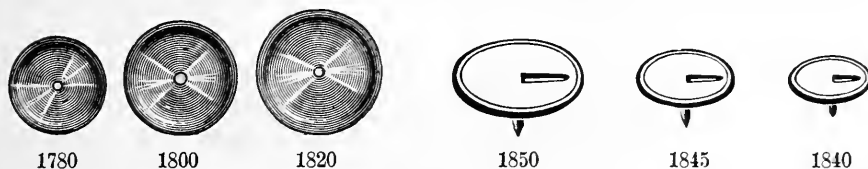
1697B

The following tables are on casters, have a clamping attachment for adjusting the slant of the top; 1697 is provided with wheel lift for raising and lowering the top:

No.		Each.
1693.	Drawing Table , ash or oak top, 21x24 inch.....	\$9 00
1694.	“ “ “ “ “ 22x26 “	9 50
1695.	“ “ “ “ “ 22x26 “ with folding arm, with plain shelf.....	11 00
1696.	Drawing Table , ash or oak top, 22x26 inch, folding arm with shelf and drawer.....	12 00
	Tables Nos. 1693 to 1696, finely ornamented and gilt, ebonized top, extra.....	5 00
1697.	Artists' Drawing Table , ash or oak top, 22x26 inch.....	12 50
	The above table, finely ornamented and gilt, top ebonized, extra.....	5 00
	The following accessories will be furnished when specially ordered:	
A.	Folding Arm , with plain shelf.....	1 50
B.	“ “ “ shelf and drawer, shown in cut No. 1697B	2 50
C.	Detachable Iron Foot Rest , when ordered with table....	1 50



DRAWING PINS OR THUMB TACKS.



No.	1780	1800	1820	1850	1845	1840	Per Doz.
1700.	Solid Steel Tacks , steel points, $\frac{5}{16}$ inch, extra fine.....						\$0 80
	"The Arrow" German Silver Tacks , best quality, made by hand, tempered steel points, screwed in and riveted.						
1720.	$\frac{3}{8}$ inch.....						60
1740.	$\frac{1}{2}$ inch.....						75
1760.	$\frac{5}{8}$ inch.....						90

Nos. 1720, 1740 and 1760 have thin beveled heads to allow T square to slide over them when working. Also have a slight bevel on lower edge of head, which allows them to be readily removed from the board by the fingers (without the use of lifter or knife), an advantage possessed by no other kind.

German Silver Tacks, steel points, screwed in and riveted, oval heads.

1780.	$\frac{3}{8}$ inch.....	60
1800.	$\frac{1}{2}$ inch.....	75
1820.	$\frac{5}{8}$ inch.....	90

Steel Stamped Tacks,

1840.	$\frac{5}{16}$ inch, per box of 100, \$0 40	08
1845.	$\frac{3}{8}$ inch, " " " 50	10
1850.	$\frac{1}{2}$ inch, " " " 65	12

"Star" Tacks, German Silver, on cards.

1860.	$\frac{3}{8}$ inch.....	15
1880.	$\frac{1}{2}$ inch.....	20
1900.	$\frac{5}{8}$ inch.....	25

"Star" Tacks, Brass, on cards.

1920.	$\frac{3}{8}$ inch.....	10
1930.	$\frac{1}{2}$ inch.....	12
1940.	$\frac{5}{8}$ inch.....	15

"Star" drawing pins or thumb tacks have riveted pins. These thumb tacks, of fair quality at a low price, are superior to ordinary makes, and very satisfactory in use.

1950. Tack Lifter, brass, nickel plated.....each, 20

A handy and simple instrument to extract thumb tacks from the drawing board. The end of the lifter is placed under the head of the tack, and takes it out without bending the point or wrenching off the head, as is done by using a knife. The handle of this instrument is a paper knife, and is handy for removing drawings which have been glued to the drawing board, etc.

HORN CENTERS.



No.	1960	1970	Each.
1960.	Horn Center , plain, $\frac{1}{2}$ inch diameter		\$0 10
1970.	"	with German silver edge, $\frac{3}{4}$ inch diameter...	50



WATER COLORS.

Dr. Fr. Schoenfeld & Co.'s Moist Water Colors.

MOIST COLORS IN TUBES.

Gouache Colors in Bottles (glass stoppers.)

1980. Tubes, each...\$0 25

Antwerp Blue.
Bone Brown.
Brown Ochre.
Brown Pink.
Brilliant Yellow, Lt.
Burnt Umber.
Burnt Sienna.
Carmine Lake, No. 2.
Charcoal Grey.
Chinese White.
Chrome Green.
Chrome Yellow, Lt.
Chrome Yellow, Deep.
Chrome Yel., Orange.
Dragon's Blood.
Emerald Green.
Gamboge.
Gold Ochre.
Green Lake, Dark.
Hooker's Green, No. 1.
Hooker's Green, No. 2.
Indian Red.
Indigo.
Ivory Black.
Lamp Black.
Light Red.
Naples Yellow.
Naples Yel., Reddish.

1981. Tubes, each...\$0 30

Asphaltum.
Carmine Lake, No. 1.
Crimson Lake.
Magenta.
Mars Yellow.
Mars Orange.

1982. Tubes, each...\$0 50

Brown Madder.
Cadmium Yellow, Lt.
Cadmium Yellow, Dp.
Cadmium Yel., Orange.

1983. Tubes, each...\$0 75

Aureolin.
Carmine.



Cobalt Blue.
Indian Yellow.
Malachite Green.
New Blue.

1984. Bottles, each..\$0 35

Neutral Tint.
Olive Green.
Payne's Grey.
Permanent Green, Lt.
Permanent Green, Med.
Permanent Green, Dp.
Prussian Blue.
Purple Lake.
Raw Sienna.
Raw Umber.
Roman Ochre.
Sap Green.
Sepia.
Terre Verte.
Vandyke Brown.
Venetian Red.
Vermilion Light.
Vermilion Deep.
Vermilion Green, Lt.
Vermilion Green, Yel.
Vermilion Green, Dp.
Warm Sepia.
Yellow Ochre, No. 1.
Yellow Ochre, No. 2.
Yellow Ultramarine,
(Lemon Yellow).
Zinc Yellow.

1985. Bottles, each..\$0 50

Mauve.
Rose Carthame.
Solferino.
Scarlet Lake.
Scarlet Vermilion.

1986. Bottles, each..\$0 75

Pink Madder.
Rose Madder.
Ultramarine Blue.

1987. Bottles, each..\$1 00

Purple Madder.
Violet Carmine.

A.H.ABBOTT & CO., CHICAGO.

WATER COLORS.

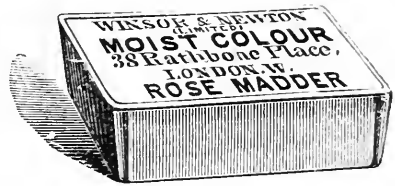
Winsor & Newton's.



Full Cake.



Half Pan.



Full Pan.

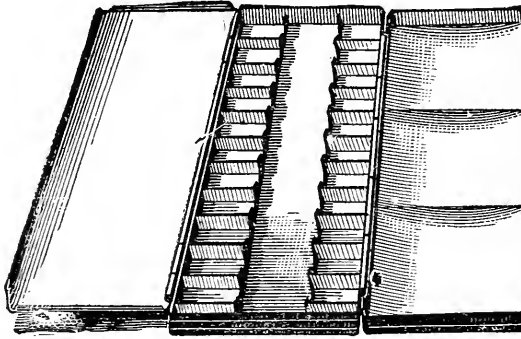
2000.	1 Antwerp blue,	16 Emeraldgreen	31 Olive green,	} Full Cake or Pan. 20 12
	2 Bistre,	*17 Flake white,	32 Payne's grey,	
	3 Blue black,	18 Gamboge,	33 Prussian blue,	
	*4 British ink,	19 Hooker's green, No. 1,	34 Prussian green,	
	*5 Bronze,	20 Hooker's green, No. 2,	35 Raw sienna,	
	6 Brown ochre,	21 Indigo,	36 Raw umber,	
	7 Brown pink,	22 Indian red,	37 Roman ochre,	
	8 Burnt sienna,	53 Italian pink,	38 Sap green,	
	9 Burnt umber,	24 Ivory black,	39 Terre verte	
	10 Chinese white,	*25 King's yellow,	40 Vandyke br'wn,	
	11 Chrome deep,	26 Lamp black,	41 Venetian red,	
	12 Chrome or'nge	27 Light red,	42 Vermilion,	
	13 Chrome yellow	28 Naples yellow,	43 Yellow lake,	
	13 Cologne earth,	29 Neutral tint.	44 Yellow ochre,	
	*15 Dragons blood	30 New blue,		
2001.	*46 Black lead,	52 Neutr'lorange,	55 Rubens' mad'er	} 45 25
	47 Brown mad'er,	63 Orange ver-	56 Scarlet lake,	
	48 Cerulean blue,	milion,	57 Scarlt'vermil'n,	
	50 Crimson lake,	53 Purple lake,	58 Sepia,	
	51 Mars yellow,	54 Roman sepia,	59 Warm sepia	
2002.	60 Cobalt blue,	62 Lemon yellow,	65 Viridian or Ver-	} 60 30
	61 Indian yellow,	64 Violet carmine	onese green,	
2003.	66 Aureolin,	71 Cadmium or-	76 Intense blue,	} 1 00 50
	67 Burnt carmine	ange,	77 Mars orange,	
	68 Carmine,	*72 Field's orange	78 Oxide chromium,	
	69 Cadmium yel-	vermilion,	79 Pink madder,	
	low,	73 French blue or	80 Pure scarlet,	
	70 Cadmium yel-	French ultramarine,	81 Rose madder or	
	low, pale,	74 Gallstone,	madder lake,	
2004.	*82 Madder	75 Indian purple,		} 1 35 70
	carmine,	83 Purple mad'er,	85 Ultramarine	
		84 Smalt,	ash,	
2005.	86 Genuine ultramarine blue, $\frac{1}{4}$ cake.....each,			\$2 25

Colors marked * are not made in full and half pans.

For Winsor & Newton colors not mentioned in this catalogue, see our special list.

EMPTY JAPANNED TIN BOXES

For Moist Water Colors,



2046

BOXES FOR HALF PANS.

No.		Each.
2030.	For 6 half pans.....	\$0 65
2031.	" 8 "	70
2032.	" 10 "	85
2033.	" 12 "	1 00
2034.	" 16 "	1 10
2035.	" 18 "	1 20
2036.	" 20 "	1 25
2037.	" 24 "	1 35
2038.	" 32 "	2 00
2039.	" 40 "	2 50

BOXES FOR WHOLE PANS.

2040.	For 6 whole pans	75
2041.	" 8 "	85
2042.	" 10 "	95
2043.	" 12 "	1 00
2044.	" 16 "	1 25
2045.	" 20 "	1 35
2046.	" 24 "	1 50



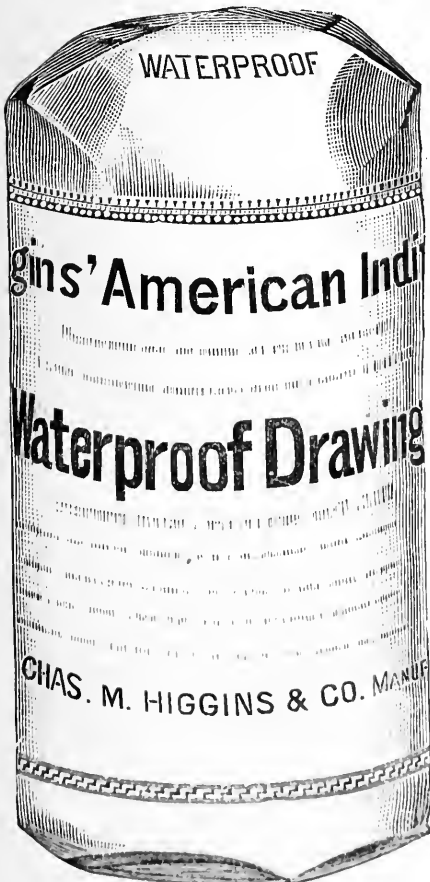
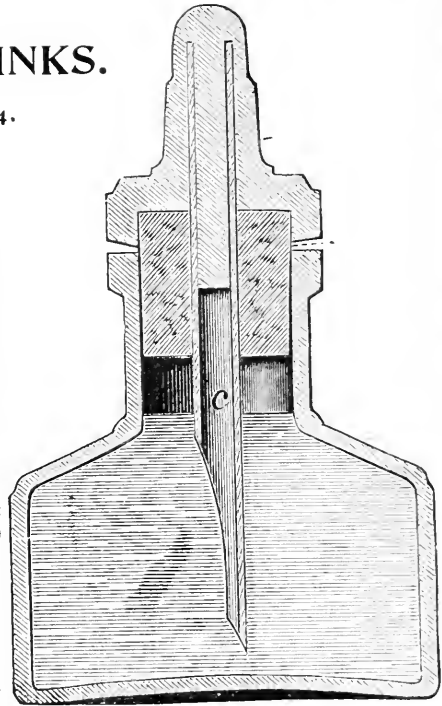
HIGGINS' INKS.

See page 174.



2064-2077 (Full Size).

Section showing Quill for filling Drawing Pen.



2060 (In Wrapper).

2060-2061—²/₃ Size.





LIQUID INDIA INKS FOR DRAWING.

Higgins' American Drawing Inks.

For Illustrations see page 173.

No.		Each.
2050.	Waterproof, black, pints.....	\$3 75
2051.	" " quarts	7 00
2060.	" " half pints (8 oz.), (see cut).....	2 00
2061.	General, " " "	2 00
2062.	" " pints.....	3 75
2064.	Waterproof " (see cut)	25
2065.	General, " "	25
2067.	Waterproof, carmine, "	25
2068.	" scarlet, "	25
2069.	" vermilion, "	25
2070.	" brick red, "	25
2071.	" blue "	25
2072.	" yellow, "	25
2073.	" green, "	25
2074.	" orange "	25
2075.	" brown, "	25
2076.	" indigo, "	25
2077.	" violet, "	25
2078.	Tray containing six bottles of Higgins' inks, assorted, of any of above colors, $\frac{3}{4}$ ounce bottles.....	1 75

HIGGINS' AMERICAN INKS are the standard liquid drawing inks of the world. They are used and endorsed by the leading schools, colleges and institutes. Three-fourths of the professional draftsmen of this country use no other drawing ink.

The manufacturers have never solicited a single testimonial, yet the merits of the inks have called forth endorsement from the most famous and experienced users of drawing inks in various professions, real masters of their arts.

NOTE ON BLACK INKS.—The Waterproof Drawing Ink (white label) is insoluble when dry, and is best for working drawings which have to stand handling, moisture, or color washes. The General Drawing Ink (red label) is soluble, and is best for india ink tints and washes, for tracings, for patent office and photo drawings, and all fine line work. Both kinds are, however, used extensively for tracing, and also for artistic pen drawings for photo engravings, some draftsmen preferring one kind and some the other. Some draftsmen mix the two inks together. Select for yourself the kind which best suits your own work.

NOTE ON COLORED INKS.—All our colors can be used for lines or washes, and are waterproof when dry, but can be freely thinned with water to produce light tints or washes, and can be mixed with each other to produce various shades or tints, as the draftsman may desire.



LIQUID INDIA AND INDELIBLE DRAWING INKS.



2080



2089

No.					Each.
2080.	Liquid Indelible Drawing ink, black				\$0 25
2081.	"	"	"	yellow	25
2082.	"	"	"	brown	25
2083.	"	"	"	blue	25
2084.	"	"	"	green	25
2085.	"	"	"	scarlet	25
2086.	"	"	"	carmine	25
2089.	Bourgeois Aine's Waterproof Drawing Ink, black,				25

In reproduction processes the quality of the result is always dependent on the quality of the original. If the copy contains defects, those defects will be intensified in the reproduction. Copy for zinc etching should have absolutely black lines, of any degree of fineness, on pure white paper. The ink used for drawings should be, if possible, Encre de Chine Liquide (Bourgeois Aine's)

A. H. ABBOTT & CO., CHICAGO.

WINSOR & NEWTON'S WATERPROOF INKS.

Bottles containing One Ounce and provided with Patent
Stopper and Quill Feeder.



2090

No.				Each.
2090.	W. & N. Waterproof Ink, black.....			\$0 25
2091.	"	"	" carmine	25
2092.	"	"	" ultramarine.....	25
2093.	"	"	" grass green	25
2094.	"	"	" purple.....	25
2095.	"	"	" violet.....	25
2096.	"	"	" turquoise	25
2097.	"	"	" sea green.....	25
2098.	"	"	" yellow.....	25

All the inks here enumerated may be thinned with water ab libitum; distilled water or clean rain water (filtered, if necessary, through blotting paper), being preferable to the ordinary sorts. In the case of W. & N. black ink it is well to make the water slightly alkaline with a little ammonia solution, say half a dozen drops to a wineglassful of water.

2098A. Tray containing six bottles of Winsor & Newton's inks,
assorted, of any of above colors, 1 ounce bottles..... 1 75

MATERIAL FOR ARTISTS IN BLACK AND WHITE.



2099



2100

No.		Each.
2099.	Albanine, a pure photographic white.....	\$0 30
2100.	Process Black, a dead black of great density.....	30

By the use of these new pigments, albanine and process black, the difficulty hitherto experienced of preserving the true values of the lights in drawings made for process reproduction is entirely obviated.

WATER COLOR LIQUIDS.

No.		Each.
2101.	Winsor & Newton's Chinese White.....	\$0 30
2102.	" " Indian Ink.....	30
2103.	" " Ox Gall	30
2104.	" " Gold Ink.....	30
2105.	" " Silver Ink.....	30
2106.	" " Carmine	30
2107.	" " Indelible Brown Ink	30
2108.	" " Prout's Brown.....	30
2109.	" " Sepia	30
2110.	" " Prussian Blue.....	30
2111.	" " Vermilion.....	30



HIGGINS' TAURINE MUCILAGE.

No.		Each.
2120.	Taurine Mucilage, 2 oz., with improved brushes.....	\$0 10
2121.	" " 4 oz., " " "	20
2122.	" " $\frac{1}{2}$ pints, with empty stand and brush..	35
2123.	" " pint bottles, alone.....	50
2124.	" " quart " "	80

ADVANTAGES OF TAURINE MUCILAGE.—Great adhesive power, quick catch and quick drying; no impurity or sediment, but perfectly clean, clear and transparent; will not corrode brush, and hence will not become dirty and stained in use; will not clog neck of bottle like the common corrosive mucilages; put up in an improved manner, with new brushes, stoppers, etc.; most convenient and attractive to the purchaser; packed in felt paper wrappers.

HIGGINS' PHOTO MOUNTER.

No.		Each.
2125.	Photo Mounter, 3 oz. jar.....	\$0 15
2126.	" " 6 " "	25
2127.	" " 14 " "	50

Higgins' Photo Mounter is an entirely novel and superior adhesive, specially prepared for mounting photographs, aristotypes, scrap pictures, engravings, etc.

HIGGINS' DRAWING BOARD AND LIBRARY MUCILAGE.

No.		Each
2128.	Drawing Board Mucilage, 3 oz.....	\$0 15
2129.	" " " 6 "	25
2130.	" " " 14 "	50

Higgins' Drawing Board and Library Mucilage is a novel semi-fluid adhesive of great strength and body, specially prepared for sticking paper to the drawing board, or any similar work requiring a quick acting and powerful adhesive.

MURILLO TRANSFER INKS.

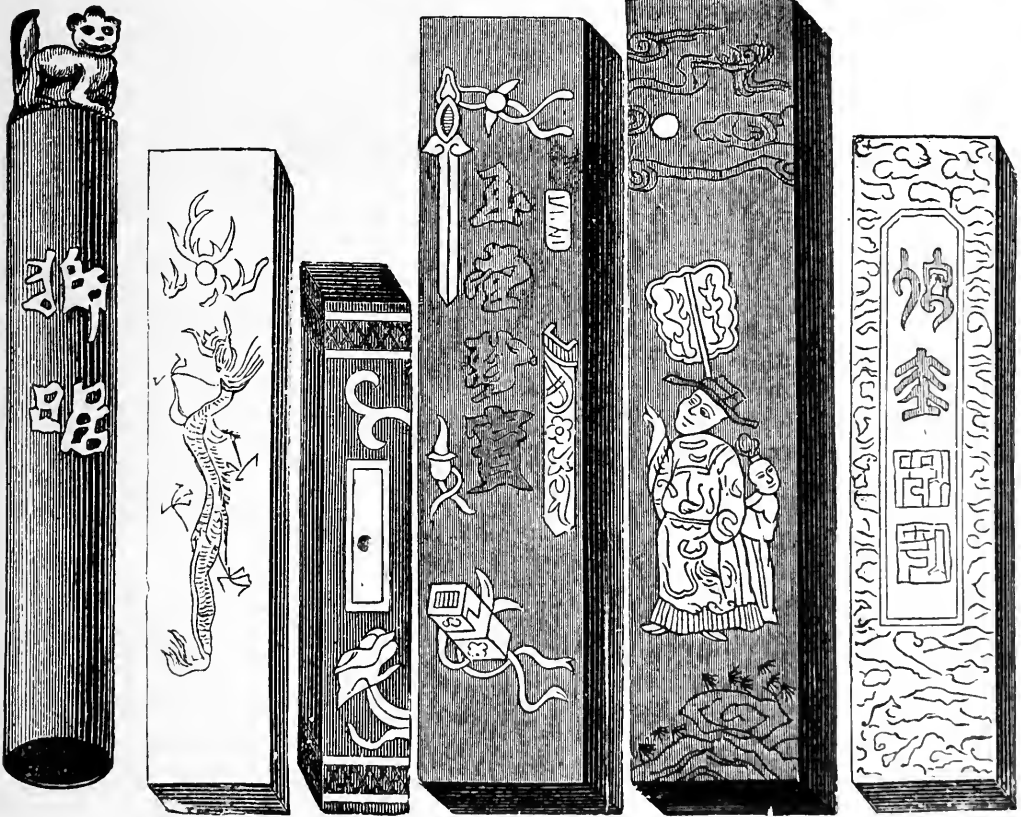
No.		
2140.	Murillo Transfer Inks, made in the following colors: red, brown, yellow, green, blue and purple, price per bottle of 1 ounce.....	\$0 25
	The same, black, per bottle of 1 ounce.....	50

These inks are made for drawings to be copied by the "Murillo Process." Specifications, price lists, letters, in fact, any kind of writing in "Murillo" transfer inks may be copied on the "Murillo" copying pad.

CHINESE OR INDIAN INK.

Fine Quality.

Imported by us directly. Illustrations full size. Nos. 2150 to 2166, as listed below, comprise a carefully selected assortment of the best brands only of Indian inks. We call attention to the special fine qualities of Nos. 2159, 2162 and 2163, which are standard brands, well known to the profession for many years.



2150

2152

2154

2156

2157

2158

No.

Per Cake.

2150.	Oval, black, fine small, $3\frac{3}{8}$ inch.....	\$0 25
2152.	Oblong, gilt, $2\frac{3}{4}$ inch	50
2153.	Square, black, gilt figures, $2\frac{1}{8}$ inch.....	30
2154.	" " " " $2\frac{3}{8}$ "	40
2155.	" " " " $2\frac{3}{4}$ "	75
2156.	Oblong, " " sword, 3 "	1 00
2157.	" " " figures, moon, $3\frac{3}{8}$ inch.....	1 25
2158.	" gilt, fine, $2\frac{3}{4}$ inch.....	1 50



CHINESE OR INDIA INK.

Fine Quality.



No.		Per Cake.
2159.	Oblong, gilt, fine, 4 inch.....	\$1 50
2160.	Square, black, gilt figures, extra super super, $3\frac{3}{4}$ inch.....	1 00
2161.	“ “ “ “ “ “ “ small, 3 inch..	50
2162.	Pearl, oblong, black, $2\frac{7}{8}$ inch, very fine quality.....	2 50
2163.	Gilt, “ $2\frac{7}{8}$ inch, fine quality	2 50
2164.	“ “ $2\frac{3}{4}$ “ “ “	2 00



CHINESE OR INDIA INK.

Extra Fine Quality.



2159A



2162A



2160A



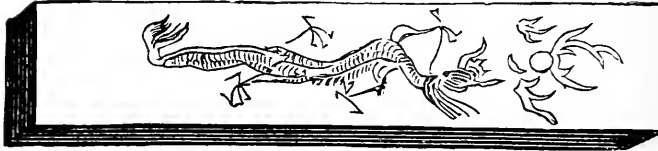
2161A

No.					Per Cake.
2159A.	Oblong,	black, gilt and blue figures,	4 inch.....		\$8 00
2160A.	Oval	" " figures,	2½ inch.....		4 00
2161A.	Oblong	" " " 2½ "	.....		5 00
2162A.	Round	" " " 2⅛ "	diameter		5 00



CHINESE OR INDIA INK.

Ordinary.



2167-2168

No.		Per Cake.
2165.	Hexagonal, gilt, $1\frac{3}{8}$ inch, fine quality.....	\$0 75
2166.	" " 2 "	1 25
2167.	Blue Chinese ink, oblong, $2\frac{3}{4}$ inches long.....	50
2168.	Red " " " $2\frac{1}{2}$ " "	50
2169.	Yellow " " " $2\frac{3}{4}$ " "	50
2170.	Crimson, $2\frac{7}{8}$ inches long, fine.....	1 00
2171.	Brown, $2\frac{7}{8}$ " " "	50
2172.	Yellow, $2\frac{7}{8}$ " " "	50
2173.	Black, common, $2\frac{1}{4}$ inches long, 64, for schools.....	10
2174.	" medium, $2\frac{3}{4}$ " " 64, " " oval lion head.	20
2175.	" " $3\frac{1}{4}$ " " 40, " " " " "	20
2176.	" " $2\frac{1}{4}$ " " 64, " " round, gilt lion head.....	20
2177.	Lion head, oval, 80.....	15

JAPANESE INK.

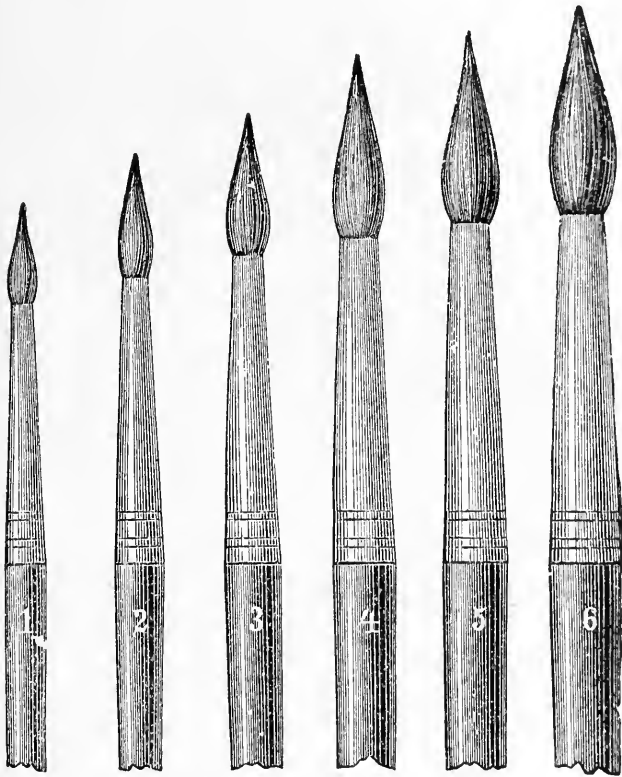
2220.	Oblong, black, small.....	1 00
2221.	" " medium.....	2 00
2222.	" " large.....	3 00

The lines drawn with this ink will not be blurred, but remain distinct when coming in contact with other tints.

2223.	Photo Drawing Ink.....	1 00
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This ink is used by the leading artists for pen and ink drawing, where a jet black ink is required for reproduction, surpassing any of the liquid inks made for this purpose.

WATER COLOR BRUSHES.

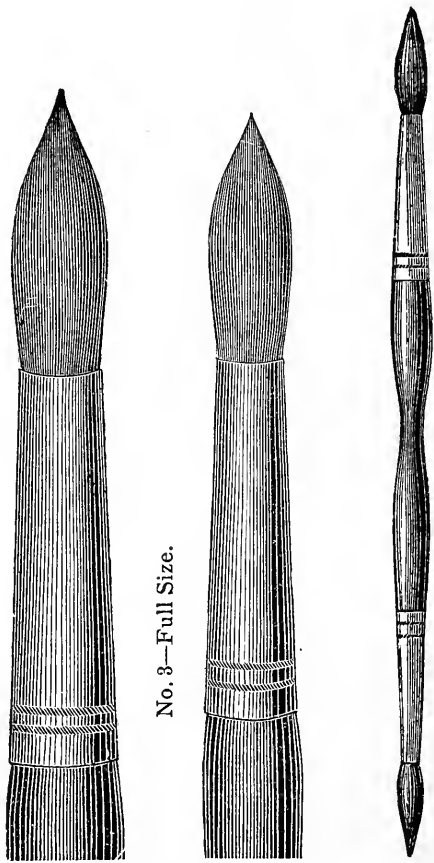


2250—Full Size.

No.	Each.
2250. Camel Hair, in tin, with red handle.	
No. 1.....	\$0 06
“ 2.....	06
“ 3.....	08
“ 4.....	08
“ 5.....	10
“ 6.....	10



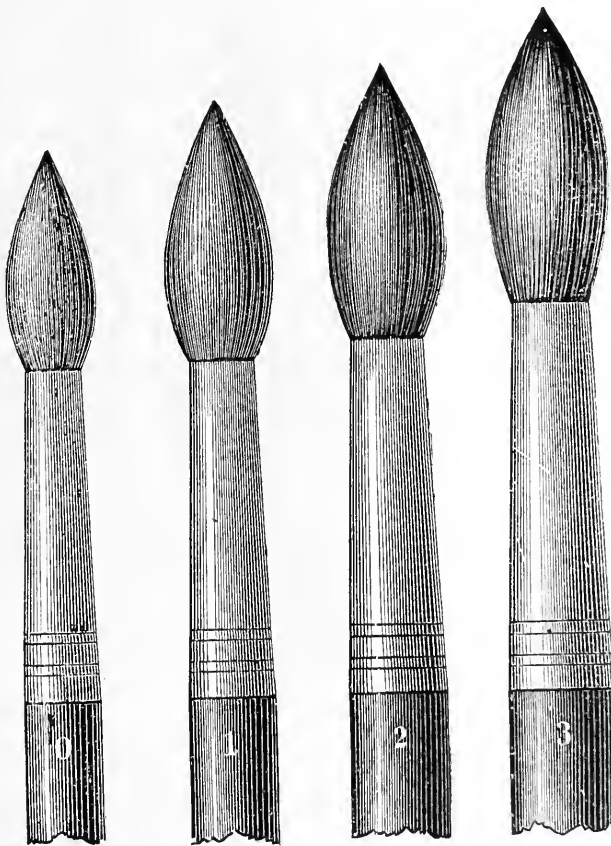
WATER COLOR BRUSHES.



No.	Each.
2260. Siberian Wash or Sky Brushes, in tin, with 2 points, size about equal to No. 2270.	
No. 0.....	\$0 30
“ 1.....	35
“ 2.....	45
“ 3.....	60
2265. Round Camel Hair, double end, sky or wash brushes, in tin.	
Nos. 6 and 8.....	\$0 25
“ 8 “ 12.....	30
“ 9 “ 13.....	35
“ 10 “ 14.....	40



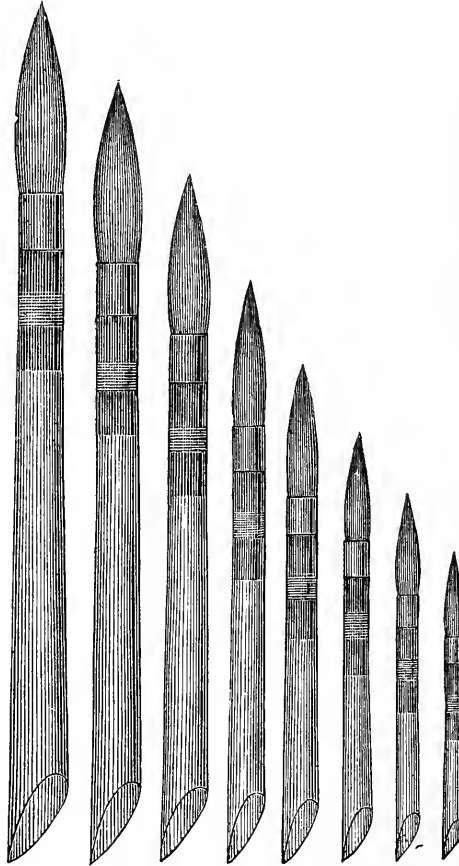
WATER COLOR BRUSHES.



No. 2270—Full Size.

No.	Each.
2270. Siberian Wash or Sky Brushes.	
0.....	\$0 20
1.....	25
2.....	30
3.....	40

WATER COLOR BRUSHES.

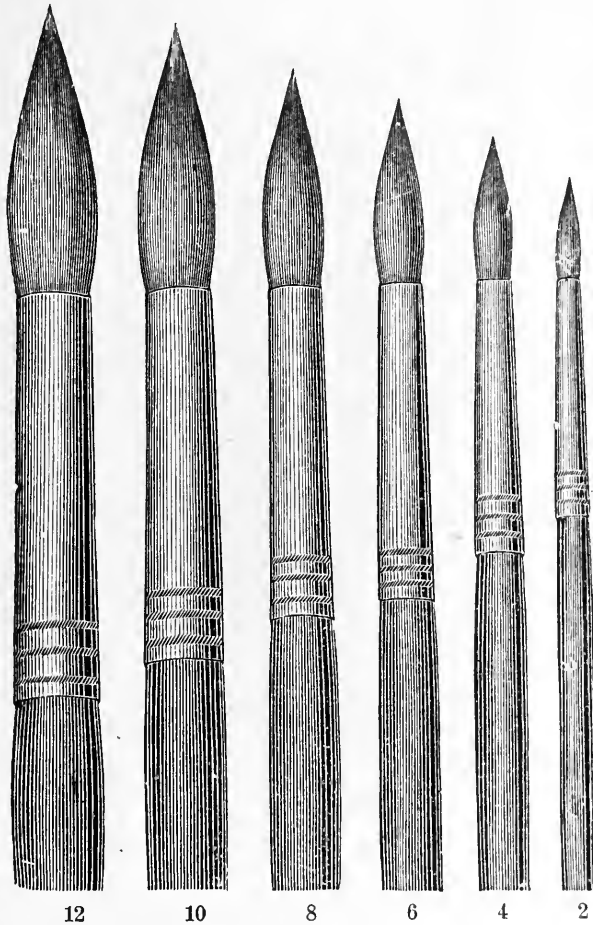


2300

No		Each.
2300.	Black Sable, in quills.	
1	.....	\$0 50
2	.....	40
3	.....	35
4	.....	30
5	.....	20
6	.....	18
7	.....	15
8	.....	12
2310.	Red Sable, in quills.	
1	.....	45
2	.....	35
3	.....	30
4	.....	25
5	.....	18
6	.....	15
7	.....	12
8	.....	12



WATER COLOR BRUSHES.



12

10

8

6

4

2

No.

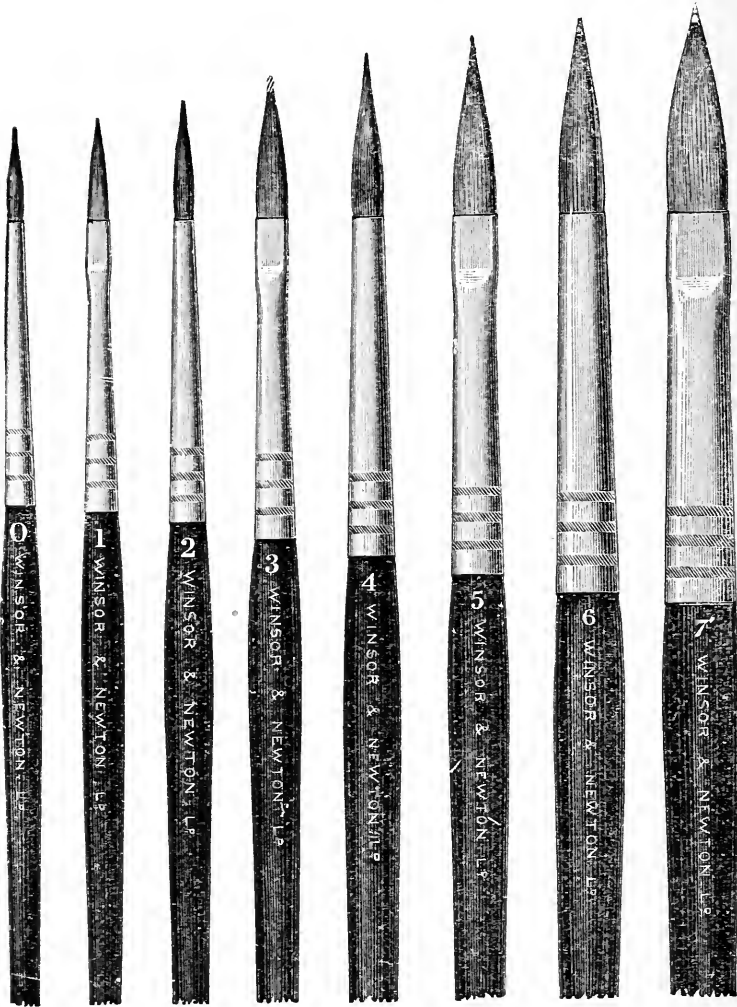
Each.

2320. Paris Red Sable Brushes, round, in albata.

0.....	80 10
1.....	10
2.....	15
3.....	20
4.....	25
5.....	35
6.....	45
7.....	55
8.....	65
9.....	85
10.....	1 10
11.....	1 30
12.....	1 65



WATER COLOR BRUSHES.



2330

No.

2330. Winsor & Newton's Red Sable, round and flat, in albata,
short polished handles.

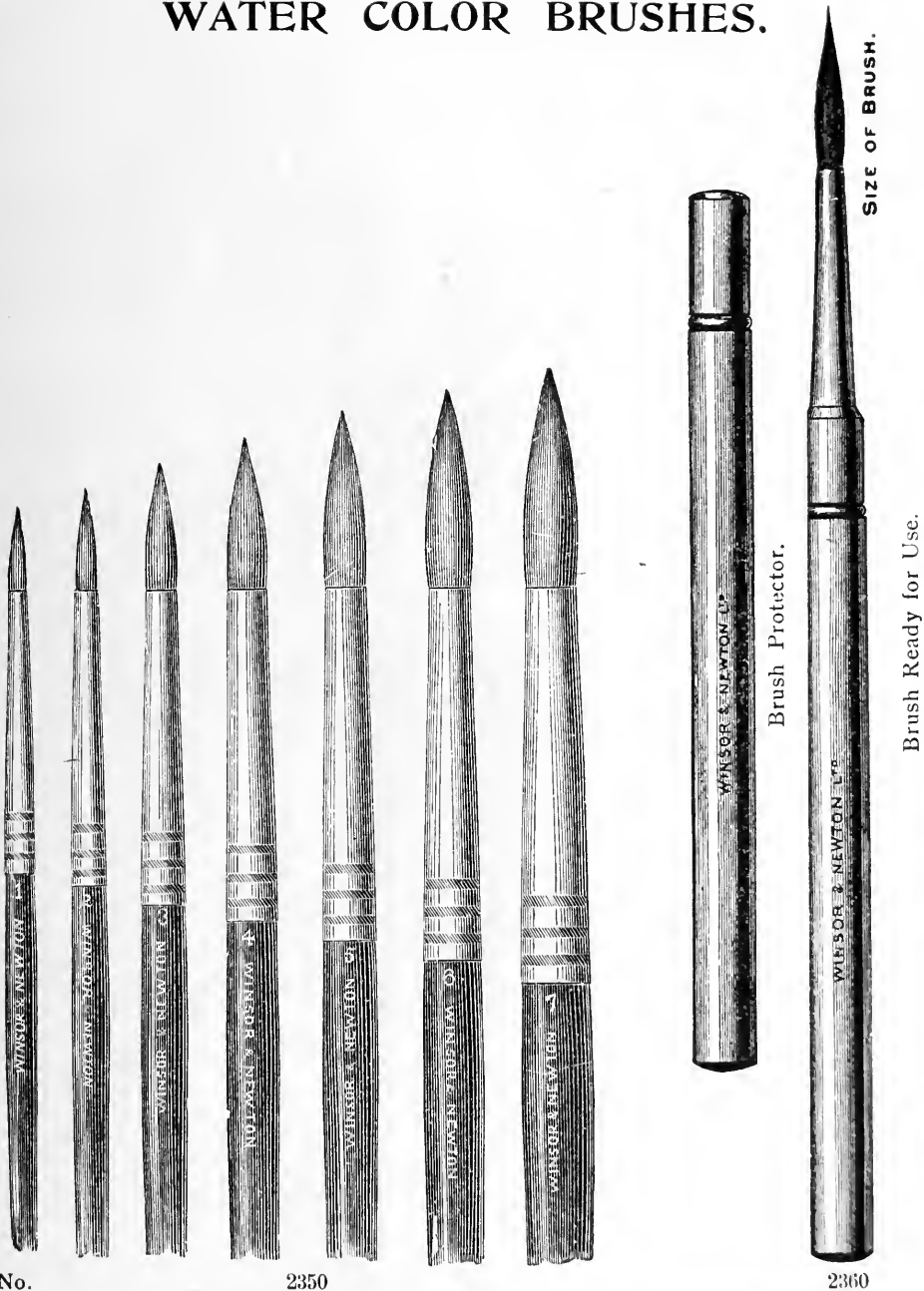
	Each.		Each.
00.....	\$0 35	4.....	\$0 75
0.....	35	5.....	85
1.....	35	6.....	1 00
2.....	45	7.....	1 25
3.....	55		

2340. Winsor & Newton's extra large Red Sable, in albata,
9 inch polished handles.

	Each.		Each.
1.....	\$2 00	4.....	\$4 75
2.....	2 75	5.....	5 75
3.....	3 75		



WATER COLOR BRUSHES.



No.

2350

2360

2350. Winsor & Newton's "New British" Red Sable Brushes,
finest quality of Red Sable hair.

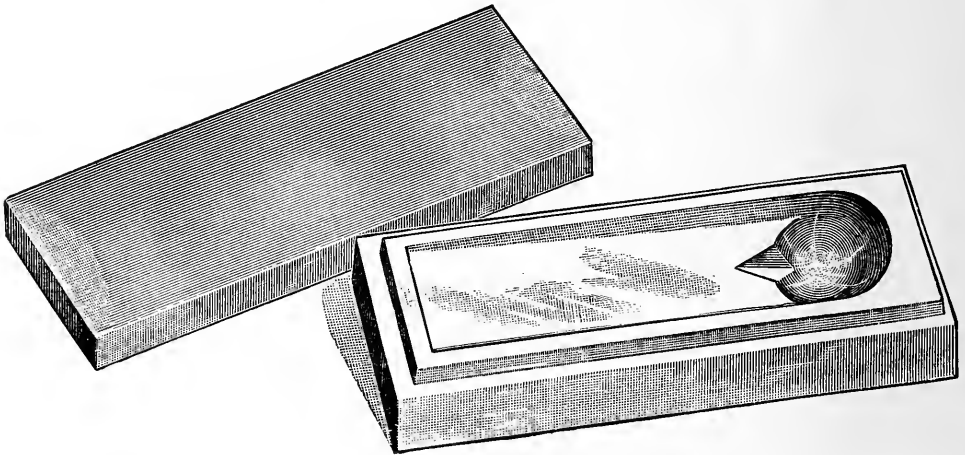
	Each.		Each.
0.....	\$0 20	4.....	\$0 45
1.....	20	5.....	55
2.....	25	6.....	65
3.....	35	7.....	75

2360. Winsor & Newton's "Pocket Sketching" Red Sable Brush..... 50

Can be carried in pocket or Sketching Box without any risk of injuring the point. Very convenient for outdoor sketching.

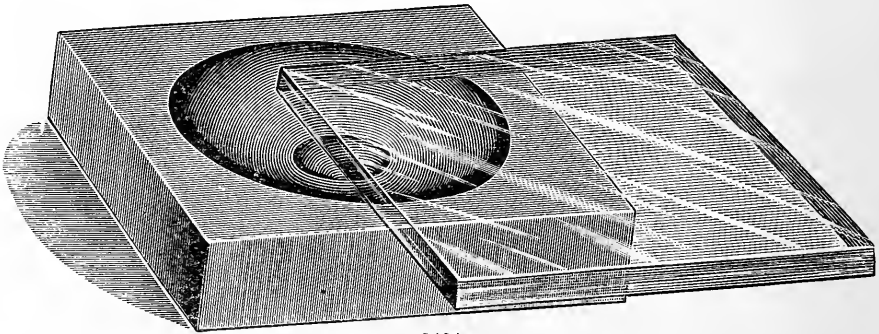


SLABS FOR GRINDING CHINESE OR INDIA INK.



2400

No.		Each.
2400.	China Ink Slab, with cover, $1\frac{3}{4} \times 4\frac{1}{2}$ inch.....	\$0 35
2401.	“ “ “ “ “ $2\frac{1}{8} \times 5\frac{1}{4}$ “	40



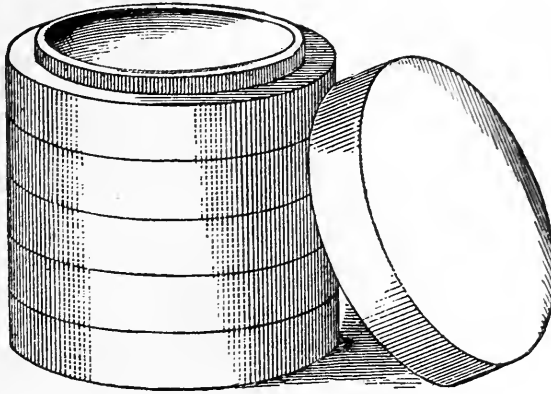
2404

2404.	Slate Ink Slab, $3\frac{1}{2}$ inches square, $\frac{3}{4}$ inch thick, with center well and air tight glass cover, $\frac{1}{8}$ inch thick.....	45
2405.	Slate Ink Slab, 5 inches square, like No. 2404.....	55

Ink Slabs Nos. 2404 and 2405 are the best cups for grinding India Ink uniform and quickly.



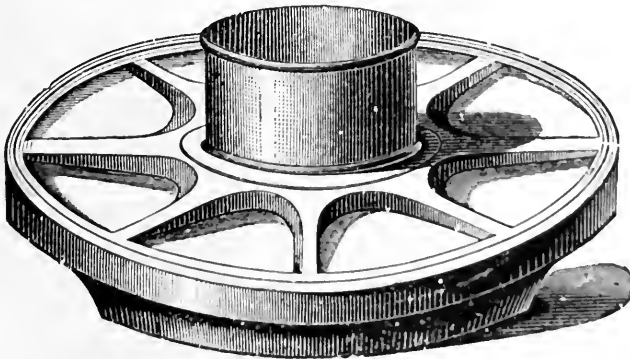
NEST OF SAUCERS AND COLOR CUPS.



2410

No.		Each.
2410.	Nest of Cabinet Saucers, 6 in set, $2\frac{3}{8}$ inches.....	\$0 45
2411.	“ “ “ 6 “ $2\frac{5}{8}$ “	55
2412.	“ “ “ 6 “ $3\frac{1}{4}$ “	65
2413.	“ “ “ 6 “ $3\frac{3}{4}$ “	80
2420.	China Color Cups.	
	$1\frac{1}{2}$ inch.....	03
	2 “	06
	$2\frac{1}{2}$ “	08
	3 “	12
	$3\frac{1}{4}$ “	15

INK AND COLOR SLABS AND TILES.

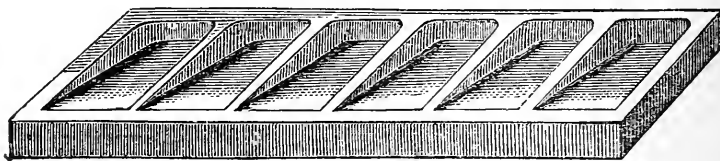


2425

2425.	Architect's Slant and Basin, with 8 divisions and cup..	1 15
2439.	Center Slab, 5 divisions, $2\frac{3}{8}$ x 6 inches.....	20



INK AND COLOR SLABS AND TILES.



2450

No.		Each.
2440.	Ink or Color Slab , 3 holes and slope, $1\frac{1}{2} \times 2\frac{3}{4}$ inches.....	10
2441.	“ “ “ “ 3 “ “ “ $2\frac{3}{8} \times 3\frac{5}{8}$ “	18
2442.	“ “ “ “ 3 “ “ “ $2\frac{3}{4} \times 4\frac{1}{4}$ “	25
2443.	“ “ “ “ 3 “ “ “ 3 x $4\frac{1}{2}$ “	30
2444.	“ “ “ “ 3 “ “ “ $3\frac{1}{4} \times 5$ “	40
2445.	Well Slab , with 3 wells, 3 slopes.....	18
2446.	“ “ “ 5 “ 5 “	55
2447.	Sloping Tile , 3 divisions, $2\frac{1}{2} \times 4$ inches.....	15
2448.	“ “ 4 “ $3\frac{1}{8} \times 7\frac{3}{4}$ “	30
2449.	“ “ 5 “ $3\frac{1}{8} \times 7\frac{3}{4}$ “	35
2450.	“ “ 6 “ $3\frac{1}{8} \times 7\frac{3}{4}$ “	40
2451.	“ “ 8 “ 6 x $7\frac{5}{8}$ “	50
2452.	“ “ 10 “ 6 x $7\frac{5}{8}$ “	55
2453.	“ “ 12 “ 6 x $7\frac{5}{8}$ “	65

ARTISTS' WATER GLASSES.

2460.	Artist's Water Glass.	
	$2\frac{3}{8}$ inch	12
	$3\frac{1}{4}$ “	25
	$3\frac{3}{4}$ “	30
	$4\frac{1}{4}$ “	35



LEAD PENCILS.

Hardtmuth's.



2490

No.		Per doz
2490.	Koh-i-noor, hexagon, yellow polished cedar, 8H, 7H, 6H, 5H, 4H, 3H, 2H, H, F. HB, B, 2B, 3B	\$1 25



2492

No.		Per doz.
2491.	Koh-i-noor, hexagon, yellow polished cedar, 4B.....	\$1 50
2492.	" " " " " 6B.....	1 80

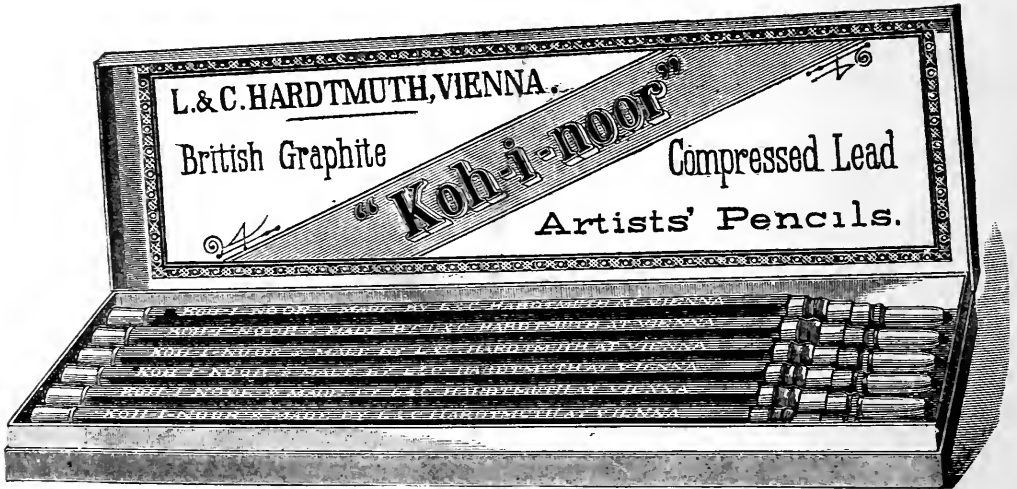


Koh-i-noor pencils are preferred by leading Architects, Engineers and Artists to any other pencil in the market. Koh-i-noor pencils are of uniform grading and will retain their fine point longer than other pencils. On account of their excellent qualities the demand for Koh-i-noor pencils, as the favorite pencil of Draftsmen and Artists, is constantly increasing. Koh-i-noor pencils are sold in neat pasteboard boxes, holding each one dozen pencils.

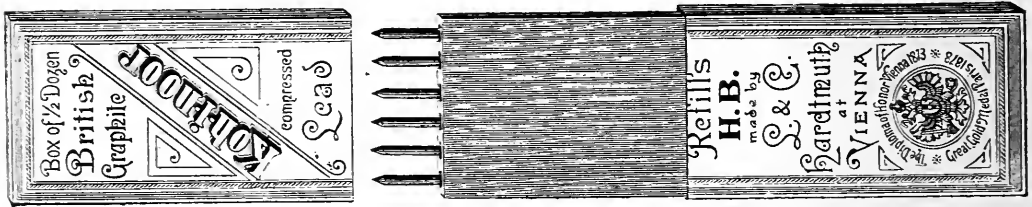


LEAD PENCILS.

Hardtmuth's.

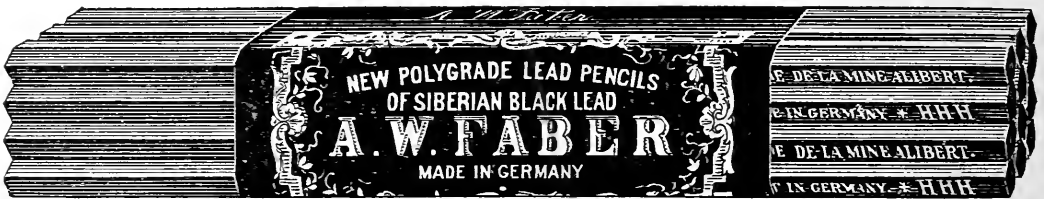


No.	2493	Each.
2493.	Artist's Pencil, with Koh-i-noor lead.....	\$0 25



No.	2494	Per box.
2494.	Koh-i-noor Leads, 6H, 5H, 4H, 3H, 2H, H, and HB. 6 in box.	\$0 60

A. W. Faber's.



No.	2500	Per Doz.
2500.	Yellow, hexagon, very best Siberian, No. 2B to 6H.....	\$1 25
2503.	Red, " " drawing, " 1 to 5.....	75
2506.	Yellow, polished, round, No. 4B to 4H.....	60
2507.	Hexagon, for mathematical instruments, No. 4.....	70
2508.	Round, " " " " 4.....	60

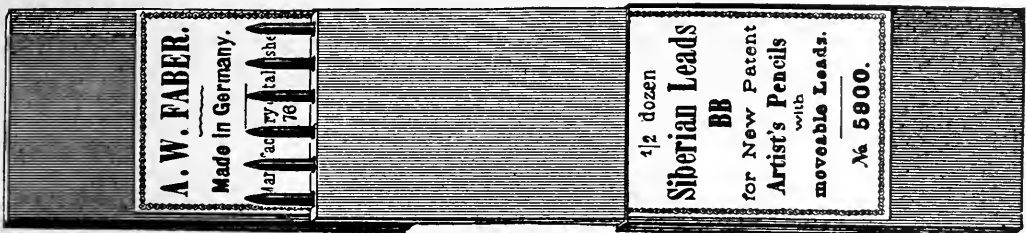


LEAD PENCILS.

A. W. Faber's.



No.	2510	Each.
2509.	Artist's Pencil, with Siberian lead, double pointed, F and 2H, or HB and 2B	\$0 35
2510.	Artist's Pencil, with Siberian Lead, single pointed, 2B to 6H	25



	2520	Per Box.
2520.	Leads for Artists' Pencils, Siberian, 6 in box, 2B to 6H.	65

COLORED PENCILS.

		Per Doz.
2523.	Hexagon, carmine and blue	\$1 25
2524.	Round, " " "	1 00
2525.	" blue or red	75

WAX CRAYONS.

						Per Doz.
2526.	Wax Crayons,	in wood,	all colors	each,	\$0 12	1 25
2527.	"	"	in boxes,	assorted colors, 6	per box,	80
	"	"	"	"	12	1 50
	"	"	"	"	18	2 00
	"	"	"	"	24	2 50
	"	"	"	"	36	3 50
	"	"	"	"	48	4 50

RED CHALK AND LUMBER CRAYONS.

		Per Doz.
2528.	Red Chalk, in cedar, for marking stakes	75
2529.	Dixon's Lumber Crayons, red or blue	1 20



BLAISDELL'S PAPER LEAD PENCILS.

No.	Per Doz.
2534. Graphite Pencils,.....	\$0 75
2535. Crayons, in red, blue or black.....	1 00

Blaisdell's Paper Pencil is one of the finest pencils made, requires no knife to sharpen it, has the best quality of lead known, can be sharpened without soiling the fingers, and lasts longer than other pencils. The covering material of these pencils consists of paper spirally wound around the lead.

DIXON'S AMERICAN GRAPHITE (LEAD) PENCILS.

No.	Per Doz.
2536. Round, polished, natural cedar. S, soft; S. M., soft medium; M. B., medium black; M., medium; M. H., medium hard; H., hard; V. H., very hard.....	\$0 60
2537. Hexagon, polished, natural cedar, S., S. M., M. B., M., M. H., H., V. H.....	75
2538. Secretary Pencils, polished, natural cedar, rubber tip, Nos. 2 and 3	50

PENCIL HOLDERS.

	Each.
2540. Pencil Holder, 4½ inches long, for holding short stubs of pencils	\$0 10

A. W. FABER'S PENCIL CASES.

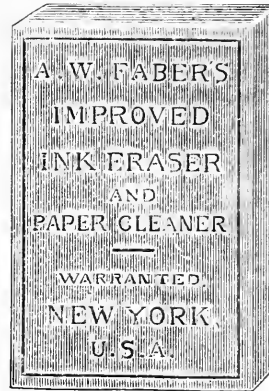
No.	Each.
2545. A. W. Faber's Pencil Cases, containing 5 Siberian pencils, \$1 00	
" " " " " 7 " " 1 25	
" " " " " 10 " " 1 75	
2546. Containing 5 Siberian pencils, rubber and knife.....	1 25
2547. A. W. Faber's Pencil Cases, containing 5 yellow round polished pencils.....	60
Same, containing 7 yellow round polished pencils.....	75
Same, containing 10 yellow round polished pencils.....	85
2548. Containing 5 yellow round polished pencils, rubber and knife. 1 00	



RUBBER.



2600



2603

No		Per Cake.
2600.	A. W. Faber's Artists' Rubber, per cake, 5, 6, 8, 10, 12, 15, 20, 25, 50 cents.	
2601.	A. W. Faber's Natural or Virgin Rubber.....	20 to \$0 50
2602.	" Black Rubber.....	10, 12, 15, 20, 25 to 50
2603.	" Ink Erasers, small, 1x1½ inch.....	5
2604.	" " large, 1¼x1⅞ inch.....	10
2605.	" " extra large, 1½x2⅜ inch....	20



2607

2606.	A. W. Faber's Ink and Pencil Erasers.....	12
2607.	" " " " mammoth	20
2609.	Elliptic Rubber.....	10 to 50
2610.	Para Rubber.....	10 to 50



RUBBER.



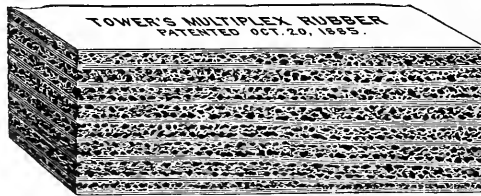
2611—Flat.



2611—Oblong.

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2611. Davidson's Velvet Rubber, flat or oblong, per cake, 8, 10, 12, 15, 20, 25 and 50 cents.

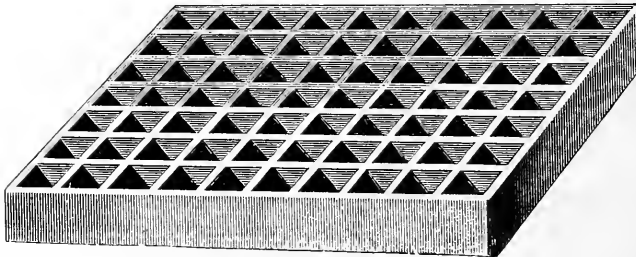


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2613

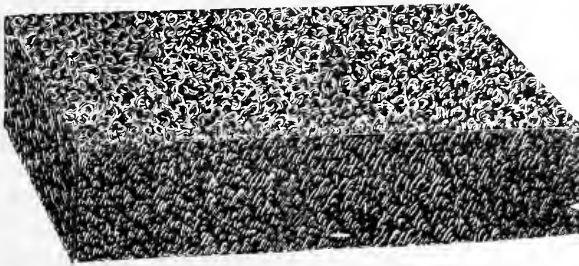
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	Per Cake.
2613. Red Pencil Rubber , moulded, small, $1\frac{1}{8} \times 1\frac{7}{8}$	\$0 15
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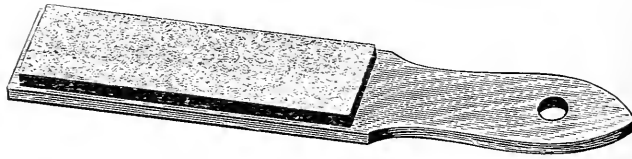


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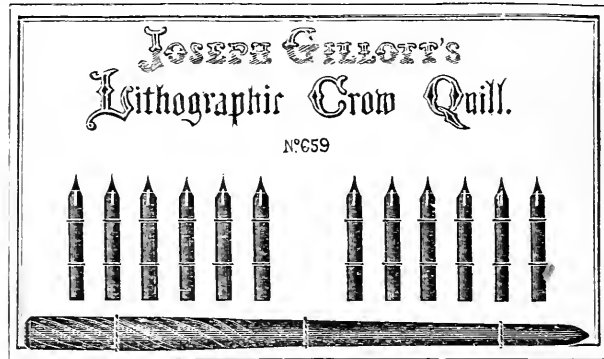


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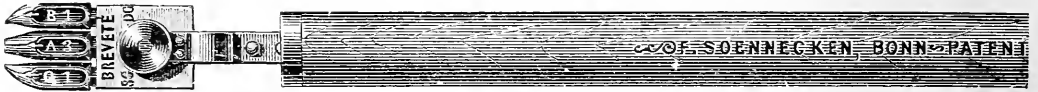


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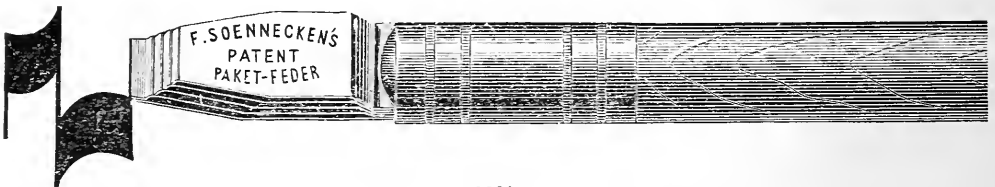


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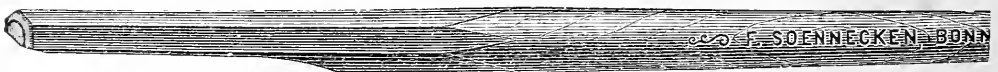
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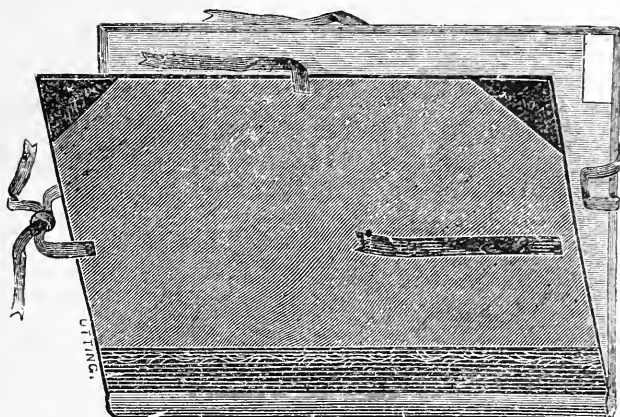


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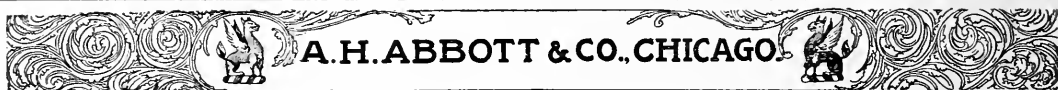
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